The New England
Journal of Medicine

VOLUME 205 JULY 9, 1931 NUMBER 2

The Massachusetts Medical Society

PROCEEDINGS OF THE SOCIETY

First Day, June 8, 1931

THE One hundred and fiftieth anniversary was observed in Boston, the Hotel Statler being the headquarters of the Society. Registration was begun at the hotel on Monday morning, June 8, where there was an attractive exhibit of both scientific and commercial character. Medical and surgical clinics were held at the Massachusetts General Hospital, both in the Ether Dome and in the surgical amphitheater. These clinics were well attended. The cancer and fracture exhibits at the Hotel Statler as well as the talking motion pictures, which were exhibited during the day, excited much interest. In the afternoon, at 4 o'clock, there was a lawn fête on the grounds of Mr. Larz Anderson in Brookline. This was attended by about 250 people in spite of showers and threatening weather.

In the evening the Shattuck Lecture was delivered by Dr. Alexander Primrose, Dean of the Faculty of Medicine and Professor of Clinical Surgery in the University of Toronto, Canada, with the title: *The Evolution of Modern Surgery.* The lecture was given in the Boston Museum of Fine Arts and was followed by a reception to the officers and invited guests. About 275 persons attended. The lecture was published in the *New England Journal of Medicine,* in the issue of June 11, 1931.

Second Day, June 9, 1931

Tuesday was marred by rainy weather. The Sections of Medicine and of Radiology and Physiotherapy held their meetings in the hotel, in the morning, the programs of all of the Sections having been published in the official program, which was distributed to all the Fellows a month in advance of the meeting, and in the official organ of the Society, the *New England Journal of Medicine,* in the issue of May 14, 1931.

At 11:30 o'clock the Supervising Censors met in Room C. of the hotel and transacted the usual business of the annual meeting, eleven Districts being represented.

At 12 noon the Council met in the Georgian Room, recessed at one o'clock for the Cotting Luncheon, reconvened at two o'clock and adjourned at three o'clock, the attendance being 163. (See Proceedings of the Council.) The Sections of Obstetrics and Gynecology and of Tuberculosis met in the hotel during the afternoon. In the evening the annual dinner, attended by 235 Fellows and guests, was served in the Ballroom. Grace was said by the Rt. Rev. Henry K. Sherrill, Bishop of Massachusetts, greetings were brought from the Commonwealth by Governor Joseph P. Ely and speeches were made by A. Lawrence Lowell, President of Harvard University; Dr. William H. Ross of Brentwood, N. Y., Ex-President of the Medical Society of the State of New York; Dr. Alexander Primrose, Dean of the Toronto School of Medicine, Canada; George Grey Turner, Professor of Surgery in the University of Durham, England and by Dr. Alfred Worcester, Henry K. Oliver Professor of Hygiene, Harvard University. The speeches will be published in the official organ of the Society. The Chair read telegrams from the New Haven County Medical Association (1784), from the Medical Society of New Jersey (1766) and from the House of Delegates of the American Medical Association, then in session, congratulating the Society on reaching its Sesquicentennial Anniversary.

Third Day, June 10, 1931

Wednesday morning the Sections of Surgery and of Pediatrics held their meetings in the hotel. At 12:15 the President called to order the annual meeting of the Society in the Ballroom. The minutes of the last meeting were read by the Secretary and adopted. The Chair read a list of the delegates from the New England state medical societies who had been present during the anniversary. Dr. J. W. Bartol spoke of the fourteen years of service Dr. Arthur K. Stone had given the Society in the office of treasurer and moved that an expression of obligation and of the thanks of the Society to him be spread upon the records, and it was so voted. The Secretary read the following statistics as to the membership of the Society and they were approved:

Membership of the Society, June 18, 1930	4622
Lost:	
By death	86
resignation	13
deprivation (a and b)	26
deprivation (c)	2
Net loss	127

Gained:		
New Fellows	200	
Readmitted by Censors	1	
Restored by Council	1	
Total gain	202	
Deduct net loss	127	
Total net gain	75	75
Membership of the Society, June 10, 1931		4697

The Chair introduced the orator, Dr. Harvey Cushing, Moseley Professor of Surgery, Harvard University, who delivered the Annual Discourse with the title: *One Hundred and Fifty Years, From Horse-back, to Gig, to Buggy, to Motor Car.* (Published in the *New England Journal of Medicine*, issue of June 11, 1931*.)

Dr. W. P. Bowers moved a vote of thanks to Dr. Cushing for his remarkable sketch of the past one hundred and fifty years which had been so much enjoyed by the large audience present and it was so voted with great applause.

There being no further business the Chair announced at 1:35 P. M. that the annual meeting was closed. The audience were guests of the Society in the same room at an appetizing and well served luncheon.

The total registered attendance at the anniversary was 836. The attendance at each of the meetings of the six Sections and the officers elected by the Sections for the year 1931-1932 follow:

SECTION OF MEDICINE. Attendance, 400
Officers:
Hervey L. Smith, Springfield, *Chairman*
Ralph W. Ellis, Worcester, *Secretary*

SECTION OF SURGERY: Attendance 200
Officers:
Richard H. Miller, Boston, *Chairman*
Allen G. Rice, Springfield, *Secretary*

SECTION OF TUBERCULOSIS: Attendance 80
Officers:
Sumner H. Remick, Waltham, *Chairman*
Roy Morgan, Westfield, *Secretary*

SECTION OF PEDIATRICS: Attendance 120
Officers:
Edwin T. Wyman, Boston, *Chairman*
Joseph Garland, Boston, *Secretary*

SECTION OF OBSTETRICS AND GYNECOLOGY: Attendance 450
Officers:
Frederick J. Lynch, Boston, *Chairman*
Frank A. Pemberton, Boston, *Secretary*

SECTION OF RADIOLOGY AND PHYSIOTHERAPY: Attendance 75
Officers:
Ralph D. Leonard, Melrose, *Chairman*
Edward H. Trowbridge, Worcester, *Secretary*

WALTER L. BURRAGE, *Secretary.*

*Under the title of "One Hundred and Fifty Years. From Tallow-dip to Television."

The Massachusetts Medical Society

OFFICERS ELECTED BY THE COUNCIL, JUNE 9, 1931

President: Halbert G. Stetson, Greenfield, 39 Federal Street.

Vice-President: Thomas H. McCarthy, Brockton, 142 Main Street.

Secretary: Walter L. Burrage, Brookline, 182 Walnut Street.

Treasurer: Charles S. Butler, Boston, 257 Newbury Street.

Orator elected for 1932: Samuel B. Woodward, Worcester.

STANDING COMMITTEES FOR 1931-1932

Committee of Arrangements
T. H. Lanman, *Chairman;* F. H. Colby, G. P. Reynolds, W. M. Shedden, W. R. Morrison.

Committee on Publications
Homer Gage, *Chairman;* J. W Bartol, R. I. Lee, R. B. Osgood, E. W. Taylor.

Committee on Membership and Finance
D. N. Blakely, *Chairman;* Gilman Osgood, G. C. Caner, J. E. Fish, H. F. Newton.

Committee on Ethics and Discipline
David Cheever, *Chairman;* W. D. Ruston, S. F. McKeen, A. C. Smith, R. L. DeNormandie.

Committee on Medical Education and Medical Diplomas
P. P. Johnson, *Chairman;* H. P. Stevens, C. H. Lawrence, C. A. Sparrow, E. S. Calderwood.

Committee on State and National Legislation
H. G. Stetson, *Chairman;* T. J. O'Brien, F. E. Jones, A. W. Marsh, Shields Warren.

Committee on Public Health
Dwight O'Hara, *Chairman;* E. F. Cody, F. G. Curtis, G. N. Hoeffel, G. D. Henderson.

Committee on Malpractice Defense
F. G. Balch, *Chairman;* E. D. Gardner, F. B. Sweet, R. P. Watkins, A. W. Allen

SPECIAL COMMITTEES FOR 1931-1932

New England Medical Council
W. P. Bowers, *Chairman;* B. W. Paddock, T. H. Lanman, J. M. Birnie, H. G. Stetson.

Committee on Cancer
W. P. Graves, *Chairman;* G. H. Bigelow, F. G. Balch, P. E. Truesdale, G. F. Martin.

Committee on Permanent Home
T. J. O'Brien, *Chairman;* S. B. Woodward, Henry Colt, C. G. Mixter, J. M. Birnie, W. G. Phippen.

Representatives To Massachusetts Central Health Council
On Administrative Board
Dwight O'Hara.
District Representatives
Eastern: E. P. Joslin, T. M. Durell.
Northeastern: J. A. Mehan, F. W. Snow.
Southeastern: W. D. Kinney, C. P. Curley.
Central: G. D. Henderson, R. W. Greene.
Western: H. J. Downey, R. J. Carpenter.

Committee on Public Education

G. R. Minot, W. H. Robey, F. J. Cotton, F. C. Irving, R. M. Smith, E. H. Place, C. C. Simmons, J. H. Pratt, H. W. Stevens, G. S. Derby, J. B. Ayer, H. P. Mosher, R. B. Osgood, F. R. Ober, E. P. Joslin, J. D. Barney, H. L. Lombard.

PRESIDENTS OF DISTRICT MEDICAL SOCIETIES

VICE-PRESIDENTS *(Ex-Officiis)*

Arranged according to seniority of fellowship in the Massachusetts Medical Society

G. H. Gray, Hyannis.
F. E. Varney, North Chelmsford
B. M. Latham, Mansfield.
J. J. McNamara, Brockton.
H. R. Nye, Leominster.
E. L. Hunt, Worcester.
G. S. Derby, Boston.
F. W. Gay, Malden.
W. B. Keeler, Roxbury.
H. H. Nevers, Lawrence.
C. H. Wheeler, Haydenville.
G. C. King, Fall River.
M. T. Sweeney, Quincy.
G. L. Schadt, Springfield.
J. H. Blaisdell, Winchester.
H. M. Kemp, Greenfield.
P. J. Sullivan, Dalton.
A. E. Parkhurst, Beverly.

DELEGATES AND ALTERNATES TO THE HOUSE OF DELEGATES OF THE AMERICAN MEDICAL ASSOCIATION

DELEGATES	ALTERNATES
H. G. Stetson, Greenfield.	W. C. Leary, Springfield.
C. E. Mongan, Somerville.	L. S. McKittrick, Boston.
J. F. Burnham, Lawrence.	E. L. Hunt, Worcester.
W. H. Robey, Boston.	Cadis Phipps, Brookline.
E. F. Cody, New Bedford.	P. E. Truesdale, Fall River.
R. I. Lee, Boston.	C. H. Lawrence, Jr., Boston.

ADMISSIONS RECORDED FROM JUNE 18, 1930 TO JUNE 10, 1931

Year of Admission	Residence	Medical College
1930	Ahern, John Joseph, Watertown	12
1931	Aitken, Alexander Philip, Dorchester	12
1930	Albert, Samuel Martin, Salem	12
1930	Allman, Charles Hugh, Boston	23
1930	Anderson, Gaylord West, Brighton	11
1930	Anderson, Justin Leavitt, Alfred, Me.	12
1931	Andrews, Katherine Sarah, Roxbury	4
1931	Archibald, Robert Edmund, Lynn	14
1931	Arnold, Horace David, Brookline. (Readmitted by Censors)	11
1930	Asselin, Elzear Francis, Lynn	7
1930	Attenberg, Samuel Ernest, Mattapan	11
1931	Badger, Theodore Learnard, Chestnut Hill (Newton)	11
1930	Barbarisi, Constantine, Everett	12
1931	Bartlett, Marshall Kinne, Boston	11
1931	*Basso, Joseph Charles, Somerville	6
1931	Baxter, Alfred Ernest, Lowell	12
1931	*Benaglia, Carl Peter, Worcester	6
1931	Berman, Harry Archer, New Bedford	10
1930	Bishop, Aubrey Clarke, Salem	12
1931	Blacklow, Leo Alfred, New Bedford	11
1931	Bloom, Herbert Kalish, Boston	10
1930	Blumenfeld, Abraham, Boston	12
1931	Bolan, Samuel, Boston	12
1931	Bourcier, Albert Ubald, Northampton	13
1930	Bouvier, Joseph Peter, Whitinsville	33
1930	Boyd, Melville Grant, Dalton	29
1930	Brailey, Allen Gilbert, Dorchester	11
1930	Bresnick, Nathan, Mattapan	12
1931	Brosnan, James Timothy, Worcester	10
1931	Brown, Edison William, Revere	12
1930	*Bruce, Arthur Oakenhead, Belmont	6
1930	Bruce, James Graham, Springfield	7
1930	Bruun, Paul Edward, Westfield	31
1930	Burnham, Leon Ray, Lynn	12
1930	Butler, Robert William, Methuen	12
1931	Caradonna, Henry, Worcester	11
1931	Casten, Virgil Glenn, Allston	11
1931	Clapp, Ralph Sheldon, Bernardston	12
1931	*Clark, Orma Lawrence, South Acton	6
1931	*Clayman, Morris, Chelsea	6
1931	Conners, Thomas Aquinas, Belmont	12
1930	Coolidge, Thomas Buckingham, Cambridge	11
1931	Corliss, Gordon Philip, Winchester	11
1930	Costanza, Frederick Pasquale, East Boston	12
1930	Costanza, Pasquale, East Boston	12
1930	Cote, Gerard, Salem	13
1930	Couillard, Edward Joachim, Northbridge	3
1930	Cournoyer, Romeo Jean, Spencer	10
1930	Crittenden, Harrison Murray, Haverhill	12
1931	Daley, Joseph Arthur, South Natick	12
1931	Deich, Jacob Frank, Dorchester	12
1930	DeSimone, Carl Albert, Brighton	10
1931	Desmond, Leo Raymond, Dorchester	11
1931	Doran, John Michael, Chelsea	3
1931	Doten, Arthur Chapman, Worcester	35
1931	Dougherty, Harry Lawton, Jamaica Plain	26
1931	Duncan, Christopher James, Boston	12
1931	Elliott, William Joseph, Worcester	26
1930	Erickson, Milton Hyland, Denver, Colo.	17
1930	Fagan, John William, Fitchburg	9
1930	Farley, William Charles	22
1931	Fein, Louis, Springfield	12
1931	Finkle, Fred, Bridgewater	12
1931	Finkle, Louis, Bridgewater	12
1931	Finnegan, William Francis, Medford	12
1931	Flower, Bardwell Hastings, Worcester	11
1931	Forkner, Claude Ellis, Belmont	11
1930	Foster, Gilbert Vincent, New Bedford	7
1930	*Fox, Isadore, Boston	32
1931	Foye, Lucian Curtis, Somerville	10
1930	Franz, Adolph Jr., Holyoke	2
1930	Freedberg, Harry, Salem	10
1930	Freeman, Harry, Worcester	11
1930	Freeman, Isadore William, Boston	10
1931	Freeman, Perrin Newell, Greenfield	12
1930	Friedman, Hyman Benjamin, Boston	12
1930	George, Henry Louis, Newtonville	11
1930	Gleason, Joseph Henry, New Bedford	31
1931	Glidden, Edson William, Worcester	3
1931	Golden, James Laurence, Medford	12
1931	Gorman, Eugene Francis, Watertown	12
1931	*Grossman, Samuel, Taunton	6
1930	Hahn, Myron Jacob, Jr., Boston	4
1930	Hartmere, Samuel John, East Boston	12
1931	Hathaway, Louis Edmund, Jr., Springfield	11
1930	Hiden, Robert Battaile, Stockbridge	23
1931	Hoffman, Donald Clare, Wellesley	11
1931	Horlick, Simon Seymour, Brighton	12
1930	*Hraba, John, Jamaica Plain	6
1930	Huyck, Clifford John, West Brookfield	27
1930	Ingraham, Franc Douglas, Brookline	11
1930	*Jacobs, Max Henry, Allston	6
1930	*Jannini, Rose Florence, Winthrop	6
1930	Johnson, Charles Isaac, Brookline	23
1930	Kaminsky, Jacob, Rutland	24
1931	Kanserstein, Arthur, Chelsea	12
1930	*Kaplan, Boris, New Bedford	36
1930	*Kaplan, Morris, Roxbury	6
1930	Kelley, Julius Goddard, Pocasset	12
1930	Kelley, Thomas Andrew, Somerville	10
1931	King, Charles Valentine, Worcester	11
1931	King, Connie Holt, South Braintree	21
1931	King, Francis Gerald, Worcester	19

1930	Kingsley, Frederick, Brighton	29
1931	Klivansky, Marcus, Lynn	12
1930	Knowles, Charles Augustus, Dorchester	12
1931	Knowlton, Wilson Warner, Lynn	11
1931	Konikov, William Morris, Boston	10
1930	Labovitz, Joseph, Dorchester	11
1930	*Lage, Fausto Pereira, New Bedford	37
1930	Lamoureux, Stanislas Albert, New Bedford	12
1931	Leeder, Eli Emanuel, Brockton	12
1930	Lerman, Jacob, Mattapan	11
1930	Levene, George, Norwood	10
1930	Lilyestrom, Sanfrey Mathew, Worcester	12
1930	*Litvich, Michael, Winthrop	6
1930	Loman, Julius, Jamaica Plain	12
1931	MacDonald, Milton Theodore, New Bedford	1
1931	Maddock, Stephen James, Cambridge	11
1931	Makler, Mark Irving, Lynn	25
1931	Mansfield, Thomas Richard, Boston	10
1930	Marien, Joseph Ernest, Fitchburg	10
1930	Marshall, Edward James, Waltham	12
1930	Matern, Herman Ludwig, Worcester	22
1931	*McCrea, Albert James, Southbridge	34
1930	McCrossan, Charles Leo, Somerville	11
1931	McGovern, Philip Patrick, Somerville	12
1931	*Meloni, Charles, East Boston	6
1931	Miller, Harold Francis, Worcester	27
1931	Monks, John Peabody, Boston	11
1930	Moran, William Gerard, Arlington	10
1930	Morrill, Herman Alfred, Gardner	7
1931	Moses, Sanford Hiram, Jr., Winchester	11
1930	Mullane, Philip Edward, Lowell	12
1930	Nell, Richard Jones, Methuen	12
1931	Noehren, Arthur Groman, Williamstown	23
1930	*Northridge, Robert James, Worcester	20
1930	Nugent, John Leo, 2d, Quincy	12
1930	O'Brien, Walter Morgan, Quincy	12
1930	Ornsteen, Frederick, Chelsea	12
1930	Orton, Lyman Ross, North Wilmington	10
1930	Palladino, Charles Alexander, Lynn	12
1930	Papavasiliou, Vasilios Konstantinos	12
1930	Parsons, Langdon, Chestnut Hill (Brookline)	11
1931	Peasley, Elmus Day, Somerset	28
1931	Pelletier, Valmore Alexis, Wrentham	11
1930	Pope, Alton Stackpole, Newtonville	12
1930	Prouty, Albert Henry, North Brookfield	11
1930	Putnam, Lawrence Arthur, Holyoke	10
1931	Quist, Frank Julius, Worcester	15
1931	Robinson, Charles Anthony, South Boston	11
1930	Ronka, Ensio Karl Frederick, Quincy	10
1930	Ross, James Gordon, Springfield	30
1930	Ross, Robert Edward, Braintree	10
1931	Rys, Henry Albert, Turners Falls	10
1930	Sacchetti, James Vincent, East Boston	11
1930	Sandberg, Samuel, Roxbury	5
1931	Saul, Leon Joseph, Roxbury	11
1930	Saver, Herbert Spencer, Dorchester	11
1931	Schildnecht, Page Milburn, Worcester	16
1930	Shapiro, Jacob, Boston	12
1930	Shaughnessy, John Robert, Salem	12
1930	*Shavelson, William, Revere	6
1930	Sidell, Samuel, Roxbury	12
1930	Siegel, Lewis, Somerville	12
1930	Sieve, Benjamin Frank, Roxbury	12
1931	Smith, Fannie Granovsky, Malden	8
1931	*Smith, Harry, Malden	32
1930	*Smith, Roswell Haydn, Edgartown	6
1931	Smith, Samuel, Winthrop	32
1930	Solo, Adrian, Somerville	10
1931	Spencer, Harvey, Newtonville	1
1930	Stetson, Richard Pratt, Brookline	11
1930	Stewart, Roger Eaton, Newton Center	2
1931	Stoller, Louis William, Pittsfield	11
1931	Strong, Archibald McIntyre, Stockbridge	2
1930	Sumberg, Elizabeth Hermina, Dedham	10
1930	Sweeney, Joseph Daniel Leo, Lowell	12
1930	Szwarc, Anthony Francis, Springfield	12
1930	Tauro, Emily Cooper, Stoneham	10
1931	Taylor, Marianna, Boston	8
1930	Teagarden, Elmer Jay, Springfield	18
1931	*Toltz, Julius Burt, Chelsea	20
1931	Tsina, Dimetra Anastas, Boston	10
1930	Tully, George William, Southbridge	12
1930	Twarog, Walter Louis, Lowell	12
1930	Urmy, Thomas Van Orden, Chestnut Hill (Brookline)	11
1930	Wakefield, Arthur Paul, Belmont	15
1930	Wallace, Richard Hendrickson, Boston	11
1931	*Wallace, Wilford Hall, Brockton	6
1931	*Wallach, Lillian Charlotte, Cambridge	6
1930	Ward, James Martin, Boston	12
1930	Wason, Isabel Mary, New Bedford	18
1930	Webster, George, Southbridge	3
1930	Weille, Francis Lee, Boston	11
1931	Wexler, Daniel, New Bedford	1
1930	Wheeler, Ralph Emerson, Boston	11
1930	Wilbur, George Browning, South Dennis	11
1930	Woodruff, Richard S., Pittsfield	9
1930	Zawacki, Bruno Edwin, Northampton	12
1930	Zielinski, Edmund John, Holyoke	16

*Indicates that the candidate's diploma was approved by the Committee on Medical Education and Medical Diplomas.

Total 200 + 1 = 201

KEY TO MEDICAL COLLEGES

1. Yale University School of Medicine
2. Columbia University College of Physicians and Surgeons
3. University of Maryland School of Medicine and College of Physicians and Surgeons
4. University of Pennsylvania School of Medicine
5. St. Louis University School of Medicine
6. Middlesex College of Medicine and Surgery
7. University of Vermont College of Medicine
8. Woman's Medical College of Pennsylvania
9. McGill University Faculty of Medicine
10. Boston University School of Medicine
11. Harvard University Medical School
12. Tufts College Medical School
13. University of Montreal Faculty of Medicine
14. Dalhousie University Faculty of Medicine
15. Rush Medical College of the University of Chicago
16. Jefferson Medical College of Philadelphia
17. University of Wisconsin Medical School
18. Johns Hopkins University School of Medicine
19. Georgetown University School of Meedicine
20. College of Physicians and Surgeons, Boston
21. University of Tennessee College of Medicine
22. Hahnemann Medical College and Hospital of Philadelphia
23. University of Virginia Department of Medicine
24. University of Nebraska College of Medicine
25. Northwestern University Medical School
26. University of Louisville School of Medicine
27. Ohio State University College of Medicine
28. State University of Iowa College of Medicine
29. Queen's University Faculty of Medicine
30. University of Western Ontario Medical School
31. Temple University School of Medicine
32. St. Louis College of Physicians and Surgeons
33. Laval University Faculty of Medicine
34. Eclectic Medical Institute, Cincinnati, Ohio
35. Long Island College Hospital
36. University of Saratov Faculty of Medicine, Saratov, Russia
37. University of Portugal Faculty of Medicine, Oporto.

DEATHS REPORTED FROM JUNE 18, 1930, TO JUNE 10, 1931

Admitted	Name	Place of Death	Date of Death	Age
1911	Abbott, Charles Edward	Andover	Jan. 25, 1931	74
1905	Bardwell, Frederick Albert	Oteen, N. C.	Feb. 15, 1931	66
1900	Barrell, Charles Sewall	Boston	Feb. 16, 1931	63
1906	Beaulieu, Francis Xavier	Taunton	June 13, 1930	51
1907	Bessey, Earle Emerson	Waterville, Me.	Feb. 16, 1931	60
1921	Blackway, Charles Everett	Fall River	Apr. 13, 1931	39
1882	Blaisdell, George Warren	Manchester	Jan. 5, 1931	74
1913	Blanchard, Paul Drake	Lowell	Mar. 23, 1931	45
1892	Bowman, Fred Raymond	Bangor, Me.	May 18, 1930	63
1907	†Brainerd, Walter Scott	Bradford	Nov. 13, 1930	71
1928	Brennan, Jeremiah Francis	Brighton	Aug. 27, 1930	37
1880	Bullard, William Norton	Boston	Apr. 13, 1931	77
1894	Burnham, Elmond Arthur	Washington, D. C.	Feb. 11, 1931	65
1884	Buzzell, Daniel Thompson	Wilmington	Dec. 21, 1930	73
1928	Caldwell, Albert Francis, Jr.	Cambridge	May 31, 1930	59
1909	Ceconi, John Aloysius	Dorchester	Sept. 21, 1930	49
1927	Chandler, Charles Henderson	Fort Fairfield, Me.	Sept. 5, 1930	44
1890	Chapman, Charles Ratchford	Longmeadow	Mar. 2, 1931	59
1885	Conibear, Laura Viola Gustin	Attleborough	Nov. 3, 1930	78
1890	Curtis, Henry Fuller	Framingham	Oct. 29, 1930	66
1882	†Cushman, George Thomas	Roxbury	Mar. 28, 1931	72
1916	Daniels, Ora George	Canton	Feb. 3, 1931	53
1909	Devenny, Joseph Henry	Dorchester	Jan. 9, 1931	52
1881	Doble, Ernest Edgar	Quincy	Jan. 16, 1931	73
1887	Dow, Edmund Scott	Allston	Feb. 6, 1931	69
1871	†Dow, James Arthur	Cambridge	May 27, 1931	86
1866	†Durgin, Samuel Holmes	Allston	Mar. 6, 1931	91
1890	Dwight, Edwin Welles	Marshfield	Jan. 14, 1931	67
1906	Eastman, Theodore Jewett	Boston	Mar. 9, 1931	51
1911	Emerson, Nathaniel Waldo	Forest Hills	Dec. 20, 1930	76
1927	Flynn, Thomas Francis	Brighton	July 20, 1930	31
1880	Fraser, John Chisholm	East Weymouth	May 27, 1931	77
1907	Gahan, Patrick Francis	Medford	Mar. 18, 1931	67
1913	Garipay, Ellsworth Peter	Lynn	Mar. 19, 1931	44
1868	Gay, George Washington	Chestnut Hill	May 30, 1931	89
1903	Gilfillan, Donald Robert	Marion, Ind.	July 29, 1930	51
1916	Gunning, Thomas Francis	Fall River	Mar. 17, 1931	68
1906	Harrison, Henry	Boston	Jan. 3, 1931	59
1901	Hill, George Sumner	Marblehead	Mar. 27, 1931	63
1908	Hoban, James John	Lowell	Sept. 6, 1930	47
1893	†Hogner, Richard Per Gustaf	Stockholm, Sweden	Oct. 13, 1930	78
1921	Holland, William Joseph	Malden	Nov. 10, 1930	56
1915	Jackson, Roy Chase	Wernersville, Pa.	Mar. 24, 1931	50
1883	Johnson, William Augustus	Lowell	June 2, 1931	72
1909	Kenney, Thomas Francis	Roxbury	Mar. 15, 1931	51
1919	Lapham, George Nelson	Rutland	Sept. 30, 1930	45
1920	Loftus, John Thomas	Worcester	Feb. 4, 1931	64
1885	Lovell, Charles Edward	Whitman	Oct. 31, 1930	69
1928	Madsen, William Joseph	Boston	July 17, 1930	45
1903	McDonald, James William	Worcester	Sept. 26, 1930	53
1927	McGovern, Thomas James	Braintree	Nov. 13, 1930	34
1924	McLaren, Alexander Lorne	East Boston	Feb. 28, 1931	54
1903	Mead, Louis Guy	Boston	June 26, 1930	56
1894	Meigs, Return Jonathan	Lowell	Apr. 6, 1931	60
1893	Merrick, Robert Michael	Dorchester	June 27, 1930	58
1901	Moore, Philip Patrick	Gloucester	Oct. 14, 1930	65
1914	Mosher, Marshall James	Waltham	Mar. 22, 1930	69
1902	Newhall, Alden Russell	Holliston	Aug. 15, 1930	55
1905	O'Brien, Joseph Jeremiah	Dorchester	Apr. 17, 1931	54
1885	O'Callaghan, Mary Vincent	Worcester	Oct. 28, 1930	78
1891	O'Meara, Michael John	Worcester	Mar. 29, 1931	69
1892	†Page, Hartstein Wendell	York Beach, Me.	Aug. 29, 1930	73
1893	Palmer, Ezra	Boston	June 5, 1931	70
1892	†Parmelee, William Josiah	Springfield	Oct. 28, 1930	72
1911	Perry, Charles Eugene	Hartford, Conn.	July 26, 1930	47
1901	Pike, Wilfred Carle	Cape Elizabeth, Me.	Aug. 21, 1930	62
1886	†Pope, Emily Frances	Boston	Aug. 28, 1930	84
1900	Provandie, Paul Hector	Melrose	Apr. 7, 1931	56
1907	Rood, Luther Colby	Dorchester	June 27, 1930	53
1868	†Root, Richmond Barbour	Georgetown	Sept. 2, 1930	83
1927	Roy, Aurele	Brockton	Oct. 25, 1930	51
1877	†Shaw, Thomas Pierpont	Lowell	Aug. 25, 1930	86
1918	Shaw, Thomas Wignall	Whitman	June 2, 1931	62
1927	Sheehan, William Arthur	Brighton	May 18, 1931	32
1903	Stowell, Frank Edgar	Worcester	Aug. 31, 1930	51
1898	Stubbs, Frank Raymond	Newton	Feb. 9, 1931	58

1921	Swift, Robert	Roslindale	July	18, 1930	71
1926	Taylor, Joseph Vincent	Boston	Nov.	15, 1930	41
1893	Thornton, James Brown	Watertown	May	20, 1931	69
1877	Towle, Henry Charles	Dorchester	Sept.	5, 1930	78
1882	†Twitchell, George Pierce	Greenfield	Dec.	2, 1930	75
1876	Wallace, Alonzo Stewart	Hudson, N. H.	Apr.	9, 1930	83
1898	Wallace, George Loney	Wrentham	July	3, 1930	58
1908	Warner, Camillus Turten	Marlborough	Jan.	18, 1931	66
1894	Whitehill, George Edward	Greensboro, Vt.	Sept.	10, 1930	69
1882	Young, John Francis	Belmont	Dec.	25, 1930	74

†Retired Fellow.

Total number of deaths, 86.

The Massachusetts Medical Society

COUNCILORS—1931-1932

ELECTED BY THE DISTRICT MEDICAL SOCIETIES AT THEIR ANNUAL MEETINGS, APRIL 15 TO MAY 15, 1931

NOTE:—The initials M. N. C. following the name of a Councilor indicate that he is a member of the Nominating Committee. V. P. indicates that a member is a Councilor by virtue of his office as President of a district society and so Vice-President of the general society. C. indicates that he is chairman of a standing committee, Sec. that he is secretary of his District Society.

BARNSTABLE

G. H. Gray, V. P., Hyannis.
W. D. Kinney, M. N. C., Osterville.
E. S. Osborne, West Dennis.
J. I. B. Vail, Sec., Hyannis.

BERKSHIRE

P. J. Sullivan, V. P., Dalton, 46 Curtis Ave.
Henry Colt, M. N. C., Pittsfield, 7 North St.
Modestino Criscitiello, Jr., Pittsfield, 8 Bank Row.
H. J. Downey, Sec., Pittsfield, 184 North St.
W. P. Kelly, Pittsfield, 61 Union St.
H. G. Mellen, Pittsfield, 150 North St.
H. B. Roney, Pittsfield, 69 Federal St.

BRISTOL NORTH

B. M. Latham, V. P., Mansfield, 26 North Main St.
W. H. Allen, Mansfield, 70 North Main St.
A. R. Crandell, Taunton, 48 Church Green.
F. A. Hubbard, M. N. C., Taunton, 157 High St.
C. B. Kingsbury, Sec., Taunton, 119 Weir St.

BRISTOL SOUTH

G. C. King, V. P., Fall River, 150 Purchase St.
J. A. Barre, Fall River, 1555 Pleasant St.
R. H. Baxter, Marion, 6 South St.
R. B. Butler, Fall River, 278 North Main St.
E. F. Cody, M. N. C., New Bedford, 105 South 6th St.
E. F. Curry, Fall River, 499 Hanover St.
D. J. Fennelly, Fall River, (Off.) Boston, 270 Commonwealth Ave.
E. D. Gardner, New Bedford, 150 Cottage St.
S. V. Merritt, Fall River, 297 Osborn St.
Charles Shanks, Sec., New Bedford, 645 Kempton St.
I. N. Tilden, Mattapoisett, Barstow St.
Russell Wood, New Bedford, 331 Union St.

ESSEX NORTH

H. H. Nevers, V. P., Lawrence, 246 Andover St.
H. G. Armitage, Haverhill, 119 Emerson St.
E. S. Bagnall, Sec., Groveland, 281 Main St.
J. F. Burnham, M. N. C., Lawrence, 567 Haverhill St.
H. F. Dearborn, Methuen, (Off.) Lawrence, 193 Garden St.
A. P. George, Haverhill, 397 Main St.
T. R. Healy, Newburyport, (Off.) Boston, 370 Marlborough St.
J. J. McArdle, Lawrence, 477 Essex St.
F. S. Smith, North Andover, 5 Third St.
F. W. Snow, Newburyport, 24 Essex St.
L. T. Stokes, Haverhill, 190 Main St.
W. D. Walker, Andover, 121 Main St.

ESSEX SOUTH

A. E. Parkhurst, V. P., Beverly, 163 Cabot St.
F. W. Baldwin, Danvers, 25 Conant St.
J. A. Bedard, Lynn, 64 Nahant St.
N. P. Breed, M. N. C., Lynn, 9 Washington Sq.
C. L. Curtis, Salem, 101 Federal St.
J. F. Donaldson, Salem, 32 Lynde St.
R. E. Foss, Peabody, 125 Main St.
E. B. Hallett, Gloucester, 63 Middle St.
W. T. Hopkins, Lynn, 7 Atlantic St.
P. P. Johnson, C., Beverly, 163 Cabot St.
J. F. Jordan, Peabody, 76 Lynn St.
O. S. Pettingill, Middleton, Essex Sanatorium.
C. H. Phillips, Beverly, 221 Cabot St.
W. G. Phippen, Salem, 31 Chestnut St.
R. E. Stone, Sec., Beverly, 88 Lothrop Blvd.
J. W. Trask, Lynn, 90 Ocean St.

FRANKLIN

H. M. Kemp, V. P., Greenfield, 42 Franklin St.
R. A. McGillicuddy, Turners Falls, 113 Avenue A.
Charles Moline, Sec., Sunderland, (Off.) South Deerfield, 120 Main St.
H. G. Stetson, President, M. N. C., Greenfield, 39 Federal St.

HAMPDEN

G. L. Schadt, V. P., Springfield, 121 Chestnut St.
F. H. Allen, Holyoke, 16 Fairfield Ave.
E. P. Bagg, Jr., Holyoke, 207 Elm St.
J. M. Birnie, Ex-Pres., Springfield, 14 Chestnut St.
L. D. Chapin, Springfield, 20 Maple St.
H. B. Chase, Westfield, Westfield State Sanatorium.
M. D. Chisholm, Westfield, 106 Elm St.
J. B. Comins, Springfield, 10 Chestnut St.
W. J. Dillon, Chicopee Falls, 121 Main St.
G. D. Henderson, Holyoke, 312 Maple St.
M. B. Hodskins, Palmer, Monson State Hospital.
E. A. Knowlton, Holyoke, 207 Elm St.
S. A. Mahoney, Sr., Holyoke, 630 Dwight St.
M. W. Pearson, Ware, 19 Pleasant St.
A. G. Rice, M. N. C., Springfield, 33 School St.
H. L. Smith, Sec., Springfield, 249 Union St.
H. W. Van Allen, Springfield, 19 Maple St.

HAMPSHIRE

C. H. Wheeler, V. P., Haydenville.
A. J. Bonneville, Hatfield, 43 Main St.
J. G. Hanson, M. N. C., Northampton, 219 Elm St.
F. E. O'Brien, Sec., Haydenville, Hampshire Co. Sanatorium.
F. H. Smith, Hadley, (Off.) Amherst, Morgan Library.

MIDDLESEX EAST

J. H. Blaisdell, V. P., Winchester, (Off.) Boston, 5 Bay State Rd.
James Blenkhorn, M. N. C., Stoneham, 26 Maple St.
A. R. Cunningham, Sec., Winchester, 76 Church St.
C. E. Montague, Wakefield, 15 Richardson Ave.
F. L. Smalley, Reading, 36 Woburn St.
R. R. Stratton, Melrose, 538 Lynn Fells Parkway.
F. T. Woodbury, Wakefield, 21 Chestnut St.

MIDDLESEX NORTH

F. E. Varney, V. P., North Chelmsford.
M. L. Alling, Lowell, 9 Central St.
J. H. Lambert, Lowell, 202 Merrimack St.
J. E. Lamoureux, Lowell, 763 Merrimack St.
G. A. Leahey, Lowell, 128 Merrimack St.
J. A. Mehan, M. N. C., Lowell, 4 Park St.
A. G. Scoboria, Chelmsford
T. A. Stamas, Sec., Lowell, 226 Central St.

MIDDLESEX SOUTH

F. W. Gay, V. P., Malden, 105 Salem St.
C. F. Atwood, Arlington, 821 Massachusetts Ave.
C. F. K. Bean, West Medford, 51 Harvard Ave.
Conrad Bell, Waltham, 820 Main St.
E. H. Bigelow, Ex-Pres., Framingham Center, 31 Pleasant St.
A. H. Blake, West Somerville, 81 College Ave.
W. T. Burke, Medford, 112 Salem St.
W. H. Crosby, Brighton, 304 Faneuil St.
D. F. Cummings, Natick, 12 East Central St.
F. G. Curtis, Chestnut Hill, (Off.) West Newton, City Health Department.
D. C. Dow, Cambridge, 1587 Massachusetts Ave.
T. M. Durell, Somerville, 131 Highland Ave.
I. J. Fisher, West Newton, 79 Chestnut St.
H. H. Flagg, Charlestown, (Off.) Revere, 270 Broadway.
F. A. Higginbotham, Watertown, 112 Mt. Auburn St.
N. M. Hunter, Hudson, 20 Lincoln St.
C. M. Hutchinson, Cambridge, 47 Garden St.
L. H. Jack, West Newton, 379 Austin St.
Josephine D. Kable, Marlborough, 42 West Main St.
H. J. Keaney, Everett, 385 Broadway.
E. D. Leonard, Chestnut Hill, 129 Monadnock Rd.
A. A. Levi, Sec., Cambridge, 114 Trowbridge St.
R. W. McAllester, Everett, (Off.) Boston, 270 Commonwealth Ave.
C. E. Mongan, Somerville, 24 Central St.
J. P. Nelligan, Cambridge, 2336 Massachusetts Ave.
Dwight O'Hara, C., Waltham, (Off.) Boston, 520 Commonwealth Ave.
L. A. Schall, Newton Center, (Off.) Boston, 270 Commonwealth Ave.
H. L. Seavey, Cambridge, 1879 Massachusetts Ave.
J. W. Sever, Cambridge, (Off.) Boston, 321 Dartmouth St.
M. J. Shaughnessey, Framingham, 188 Concord St.
F. G. Smith, Somerville, 145 Highland Ave.
C. H. Staples, Malden, 180 Summer St.
E. H. Stevens, M. N. C., Cambridge, 1911 Massachusetts Ave.
H. W. Thayer, Newtonville, 355 Walnut St.
H. J. Walcott, Concord, 92 Main St.
H. P. Walcott, Ex-Pres., Cambridge, 11 Waterhouse St.
H. R. Webb, Arlington, 22 Pleasant St.
W. S. Whittemore, Cambridge, 3 Concord Ave., Suite 1.
Alfred Worcester, Ex-Pres., Waltham, 314 Bacon St.

NORFOLK

W. B. Keeler, V. P., Roxbury, 136 Warren St.
J. W. Ball, Brookline, 1677 Beacon St.
F. J. Bailey, Dorchester, 40 Hancock St.
F. G. Balch, C., Jamaica Plain, (Off.) Boston, 279 Clarendon St.
W. W. Barker, Dorchester, 25 Lyndhurst St.
A. S. Begg, West Roxbury, (Off.) Boston, 80 E. Concord St.
D. N. Blakely, C., Brookline, (Off.) Boston, 87 Milk St.
W. L. Burrage, Secretary, Brookline, 182 Walnut St.
W. S. Burrage, Brookline, (Off.) Boston, 261 Beacon St.
F. S. Cruickshank, Sec., Roslindale, 31 Robert St.
S. F. Curran, Dorchester, 104 Norfolk St.
A. H. Davison, Milton, 76 Blue Hills Parkway.
D. G. Eldridge, M. N. C., Dorchester, 15 Monadnock St.
W. C. Emery, Dorchester, 430 Columbia Rd.
C. B. Faunce, Jr., Jamaica Plain, (Off.) Boston, 412 Beacon St.
C. S. Francis, Brookline, 76 High St.
N. W. Gillespie, Dorchester, 632 Columbia Rd.
W. A. Griffin, Sharon, (Off.) Boston, 311 Beacon St.
J. B. Hall, Roxbury, 60 Windsor St.
H. B. Jackson, Jamaica Plain, 9 Harris Ave.
G. W. Kaan, Reading, 37 Prescott St.
W. C. Kite, Milton, 17 Russell St.
W. A. Lane, Milton, 173 School St.
Olga C. Leary, Jamaica Plain, (Off.) Boston, 43 Bay State Rd.
C. L. MacGray, Needham, 1088 Great Plain Ave.
Charles Malone, Jamaica Plain, 46 St. John St.
S. F. McKeen, Brookline, 96 Dean Rd.
J. R. McPeake, Milton, 16 Blue Hills Parkway.
T. J. Murphy, Roxbury, (Off.) Boston, 520 Beacon St.
W. R. Ohler, Jamaica Plain, (Off.) Roxbury, 319 Longwood Ave.
E. P. Powers, Roxbury, 664 Huntington Ave.
Frederick Reis, Dorchester, 464 Washington St.
H. B. C. Riemer, Norwood, (Off.) Boston, 128 Newbury St.
S. A. Robins, Roxbury, (Off.) Boston, 636 Beacon St.
C. A. Rowe, Milton, 454 Adams St.
M. V. Safford, Jamaica Plain, 15 Grovenor Rd.
W. L. Turetsky, Dorchester, 1077 Blue Hill Ave.
H. F. R. Watts, Dorchester, 6 Monadnock St.
W. A. White, Roxbury, (Off.) Boston, 57 Canal St.
W. H. Young, Dedham, (Off.) Boston, 270 Commonwealth Ave.

NORFOLK SOUTH

M. T. Sweeney, V. P., Atlantic, 112 Billings Rd.
C. S. Adams, Wollaston, 62 Brook St.
W. G. Curtis, Wollaston, 10 Grand View Ave.
G. V. Higgins, Randolph, Warren St.
F. E. Jones, Quincy, 1150 Hancock St.
N. R. Pillsbury, Sec., South Braintree, Norfolk County Hospital.
C. A. Sullivan, M. N. C., South Braintree, 20 Pond St.

PLYMOUTH

J. J. McNamara, V. P., Brockton, 231 Main St.
W. G. Brown, Plymouth, 4 North St.
E. D. Hill, M. N. C., Plymouth, 27 Court St.

T. H. McCarthy, Vice-President, Brockton, 142 Main St.
G. A. Moore, Sec., Brockton, 167 Newbury St.
F. W. Murdock, Brockton, 56 West Elm St.
J. P. Shaw, Brockton, 6 Main St.
A. C. Smith, Brockton, 142 Main St.
D. B. Tuholski, Brockton, 105 Main St.

SUFFOLK

G. S. Derby, V. P., Boston, 5 Bay State Rd.
A. W. Allen, Boston, 264 Beacon St.
A. E. Austin, Boston, 270 Commonwealth Ave.
J. W. Bartol, Ex-Pres., M. N. C., Boston, 1 Chestnut St.
G. H. Bigelow, Boston, State House, Rm. 546.
Horace Binney, Boston, 403 Beacon St.
Gerald Blake, Boston, 311 Beacon St.
W. B. Breed, Boston, 264 Beacon St.
W. J. Brickley, Boston, 524 Commonwealth Ave.
J. E. Briggs, Boston, 477 Beacon St.
C. S. Butler, Treasurer, Boston, 257 Newbury St.
David Cheever, C., Boston, Peter Bent Brigham Hospital.
R. C. Cochrane, Boston, 319 Longwood Ave.
F. H. Colby, Boston, 6 Commonwealth Ave.
F. J. Cotton, Boston, 520 Commonwealth Ave.
A. H. Crosbie, Boston, 520 Commonwealth Ave.
W. P. Cross, South Boston, 4991 Broadway.
Lincoln Davis, Boston, 205 Beacon St.
R. L. DeNormandie, Boston, 355 Marlborough St.
G. P. Denny, Boston, 66 Commonwealth Ave.
W. H. Ensworth, East Boston, 40 Princeton St.
R. B. Greenough, Ex-President, Boston, 8 Marlborough St.
J. B. Hawes, 2d, Boston, 11 Marlborough St.
John Homans, Boston, Peter Bent Brigham Hospital.
H. T. Hutchins, Boston, 520 Commonwealth Ave.
E. P. Joslin, Boston, 81 Bay State Rd.
F. S. Kellogg, Boston, 19 Bay State Rd.
T. H. Lanman, C., Boston, 264 Beacon St.
R. I. Lee, Boston, 264 Beacon St.
G. A. Leland, Boston, 144 Commonwealth Ave.
L. S. McKittrick, Sec., Boston, 205 Beacon St.
Richard Metcalf, Winthrop, 114 Pleasant St.
Michele Nigro, Revere, 270 Broadway.
T. J. O'Brien, Boston, 501 Beacon St.
A. K. Paine, Boston, 80 Bay State Rd.
W. S. Parker, Boston, 472 Commonwealth Ave.
W. F. Regan, Boston, 19 Bay State Rd.
G. C. Shattuck, Boston, 520 Commonwealth Ave.
W. R. Sisson, Boston, 319 Longwood Ave.
Louisa Paine Tingley, Boston, 9 Massachusetts Ave.
G. L. Tobey, Jr., Boston, 270 Commonwealth Ave.
J. R. Torbert, Boston, 252 Marlborough St.
Conrad Wesselhoeft, Boston, 366 Commonwealth Ave.
P. D. White, Boston, Massachusetts General Hospital.

WORCESTER

E. L. Hunt, V. P., Worcester, Worcester City Hospital.
J. C. Austin, Spencer, 176 Main St.
W. P. Bowers, Ex-Pres., Clinton, 264 Chestnut St.
L. R. Bragg, Webster, 260 Main St.
F. H. Clapp, North Grafton.
P. H. Cook, Worcester, 27 Elm St.
W. J. Delahanty, Worcester, 5 Trumbull Sq.
G. A. Dix, Worcester, 6 Ashland St.
G. E. Emery, Worcester, 340 Main St.
M. F. Fallon, Worcester, 390 Main St.
Homer Gage, C., Worcester, 8 Chestnut St.
J. J. Goodwin, Clinton, 199 Chestnut St.
David Harrower, M. N. C., Worcester, 13 Elm St.
A. W. Marsh, Worcester, 690 Main St.
E. C. Miller, Sec., Worcester, 27 Elm St.
J. W. O'Connor, Worcester, 36 Pleasant St.
W. C. Seelye, Worcester, 390 Main St.
A. M. Shattuck, Worcester, 21 High St.
E. H. Trowbridge, Worcester, 36 Pleasant St.
R. P. Watkins, Worcester, 332 Main St.
F. H. Washburn, Holden, Main St.
S. B. Woodward, Ex-Pres., Worcester, 58 Pearl St.

WORCESTER NORTH

H. R. Nye, V. P., Leominster, 19 Lancaster St.
F. R. Dame, Athol, 1302 Main St.
C. H. Jennings, Sec., Fitchburg, 82 Mechanic St.
J. H. Kearney, Fitchburg, 147 Prichard St.
A. F. Lowell, M. N. C., Gardner, 22 Vernon St.
W. F Sawyer, Fitchburg, 67 Prichard St.

CENSORS

BARNSTABLE

W. D. Kinney, Osterville, *Supervisor.*
J. H. Higgins, Marstons Mills.
E. E. Hawes, Hyannis.
C. E. Harris, Hyannis.
J. B. Nickerson, West Harwich

BERKSHIRE

Henry Colt, Pittsfield, *Supervisor.*
M. H. Walker, Pittsfield.
M. S. Eisner, Pittsfield.
I. S. F. Dodd, Pittsfield.
J. F. McLaughlin, Adams.

BRISTOL NORTH

F. A. Hubbard, Taunton, *Supervisor.*
T. F. Clark, Taunton.
J. L. Murphy, Taunton.
A. R. Crandell, Taunton.
T. J. Robinson, Taunton.

BRISTOL SOUTH

S. V. Merritt, Fall River, *Supervisor*
D. P. O'Brien, New Bedford.
F. M. Howes, New Bedford.
D. D. Pratt, New Bedford.
W. F. MacKnight, Fall River.

ESSEX NORTH

F. S. Smith, North Andover, *Supervisor.*
E. P. Laskey, Haverhill.
C. F. Warren, Amesbury.
John Parr, Methuen.
R. S. Toppan, Newburyport.

ESSEX SOUTH

J. F. Jordan, Peabody, *Supervisor.*
R. W. Haywood, Salem.
A. E. Parkhurst, Beverly.
C. A. Worthen, Lynn.
Hanford Carvel, Gloucester.

FRANKLIN

R. A. McGillicuddy, Turners Falls, *Supervisor.*
J. W. Cram, Colrain.
J. C. O'Brien, Greenfield.
H. N. Howe, Greenfield.
A. H. Ellis, Greenfield.

HAMPDEN

L. D. Chapin, Springfield, *Supervisor.*
G. L. Steele, Springfield.
M. W. Harrington, Indian Orchard.
A. J. Douglas, Westfield.
G. L. Gabler, Holyoke.

HAMPSHIRE

A. J. Bonneville, Hatfield, *Supervisor.*
M. E. Cooney, Northampton.
L. B. Pond, Easthampton.
E. H. Copeland, Northampton.
J. D. Collins, Northampton.

MIDDLESEX EAST

C. E. Montague, Wakefield, *Supervisor.*
W. A. Hutton, Melrose.
C. E. Allison, Wakefield.
N. P. Hersam, Stoneham.
C. E. Ordway, Winchester.

MIDDLESEX NORTH

M. L. Alling, Lowell, *Supervisor.*
W. F. Ryan, Lowell.
G. O. Lavalee, Lowell.
D. J. Ellison, Lowell.
J. J. Cassidy, Lowell.

MIDDLESEX SOUTH

N. M. Hunter, Hudson, *Supervisor.*
F. R. Jouett, Cambridge.
Dwight O'Hara, Waltham.
J. A. McLean, West Somerville.
H. F. Keever, Auburndale.

NORFOLK

A. H. Davison, Milton, *Supervisor.*
J. S. H. Leard, West Roxbury.
J. S. May, Roxbury.
H. K. Boutwell, Brookline.
E. P. Ruggles, Dorchester.

NORFOLK SOUTH

C. S. Adams, Wollaston, *Supervisor.*
O. H. Howe, Cohasset.
C. J. Lynch, Quincy.
F. A. Bartlett, Quincy.
J. H. Ash, Quincy.

PLYMOUTH

J. P. Shaw, Brockton, *Supervisor.*
L. A. Baker, Middleborough.
R. B. Rand, North Abington.
A. W. Carr, Bridgewater.
Charles Hammond, Hanover.

SUFFOLK

G. P. Denny, Boston, *Supervisor.*
F. W. Palfrey, Boston.
A. K. Paine, Boston.
Horace Binney, Boston.
G. L. Tobey, Jr., Boston.

WORCESTER

G. A. Dix, Worcester, *Supervisor*
O. H. Stansfield, Worcester.
B. H. Alton, Worcester.
R. S. Perkins, Worcester.
M. B. Fox, Worcester.

WORCESTER NORTH

W. F. Sawyer, Fitchburg, *Supervisor.*
F. H. Thompson, Jr., Fitchburg.
George Mossman, Gardner.
C. H. Jennings, Fitchburg.
A. A. Wheeler, Leominster.

COMMISSIONERS OF TRIALS

1931-1932

BARNSTABLE—F. O. Cass, Provincetown.
BERKSHIRE—Henry Colt, Pittsfield.
BRISTOL NORTH—C. S. Holden, Attleborough.
BRISTOL SOUTH—A. C. Lewis, Fall River.
ESSEX NORTH—J. E. Bryant, Haverhill.
ESSEX SOUTH—J. E. Simpson, Salem.
FRANKLIN—F. E. Johnson, Erving.
HAMPDEN—J. M. Birnie, Springfield.
HAMPSHIRE—C. A. Byrne, Hatfield.
MIDDLESEX EAST—C. E. Ordway, Winchester.
MIDDLESEX NORTH—H. W. Jewett, Lowell.
MIDDLESEX SOUTH—E. P. Stickney, Arlington.
NORFOLK—H. F. R. Watts, Dorchester.
NORFOLK SOUTH—N. S. Hunting, Quincy.
PLYMOUTH—I. I. Richmond, East Bridgewater.
SUFFOLK—Channing Frothingham, Boston.
WORCESTER—W. P. Bowers, Clinton.
WORCESTER NORTH—C. H. Bailey, Gardner.

OFFICERS OF THE DISTRICT MEDICAL SOCIETIES

ELECTED BY THE DISTRICT MEDICAL SOCIETIES BETWEEN APRIL 15 AND MAY 15, 1931

(The street addresses of the officers may be obtained from the Annual Directory.)

BARNSTABLE—*President*, G. H. Gray, Hyannis; *Vice-President*, J. L. Chute, Osterville; *Secretary*, J. I. B. Vail, Hyannis; *Treasurer*, H. B. Hart, Yarmouthport; *Librarian*, E. E. Hawes, Hyannis.

BERKSHIRE—President, P. J. Sullivan, Dalton; *Vice-President*, A. C. England, Pittsfield; *Secretary*, H. J. Downey, Pittsfield; *Treasurer*, C. T. Leslie, Pittsfield.

BRISTOL NORTH—President, B. M. Latham, Mansfield; *Vice-President*, F. V. Murphy, Attleborough; *Secretary*, C. B. Kingsbury, Taunton; *Treasurer*, J. V. Chatigny, Taunton.

BRISTOL SOUTH—*President*, G. C. King, Fall River; *Vice-President*, J. M. Salles, New Bedford; *Secretary and Treasurer*, Charles Shanks, New Bedford.

ESSEX NORTH—*President*, H. H. Nevers, Lawrence; *Vice-President*, O. P. Mudge, Amesbury; *Secretary and Treasurer*, E. S. Bagnall, Groveland.

ESSEX SOUTH—*President*, A. E. Parkhurst, Beverly; *Vice-President*, R. E. Foss, Peabody; *Secretary*, R. E. Stone, Beverly; *Treasurer*, Andrew Nichols, 3rd, Danvers; *Librarian*, C. M. Cobb, Lynn.

FRANKLIN—*President*, H. M. Kemp, Greenfield; *Vice-President*, A. E. Johnson, Jr., Greenfield; *Secretary and Treasurer*, Charles Moline, Sunderland.

HAMPDEN—*President*, G. L. Schadt, Springfield; *Vice-President*, F. H. Allen, Holyoke; *Secretary and Treasurer*, H. L. Smith, Springfield.

HAMPSHIRE—President, C. H. Wheeler, Haydenville; *Vice-President*, M. E. Cooney, Northampton; *Secretary and Treasurer*, F. E. O'Brien, Haydenville; *Librarian*, Jane B. Armstrong, Northampton.

MIDDLESEX EAST—*President*, J. H. Blaisdell, Winchester; *Vice-President*, C. W. DeWolf, Wakefield; *Secretary*, A. R. Cunningham, Winchester; *Treasurer*, Richard Dutton, Wakefield; *Librarian*, J. M. Wilcox, Woburn.

MIDDLESEX NORTH—*President*, F. E. Varney, North Chelmsford; *Vice-President*, Pierre Brunelle, Lowell; *Secretary*, T. A. Stamas, Lowell; *Treasurer*, M. D. Bryant, Lowell; *Librarian*, P. J. Meehan, Lowell.

MIDDLESEX SOUTH—*President*, F. W. Gay, Malden; *Vice-President*, A. H. Blake, Somerville; *Secretary*, A. A. Levi, Cambridge; *Treasurer*, Edward Mellus, Newton.

NORFOLK—*President*, W. B. Keeler, Roxbury; *Vice-President*, S. F. Curran, Dorchester; *Secretary*, F. S. Cruickshank, Roslindale; *Treasurer*, G. W. Kaan, Reading.

NORFOLK SOUTH—*President*, M. T. Sweeney, Quincy; *Vice-President*, W. J. McCausland, Quincy; *Secretary, Treasurer and Librarian*, N. R. Pillsbury, South Braintree.

PLYMOUTH—*President*, J. J. McNamara, Brockton; *Vice-President*, C. G. Miles, Brockton; *Secretary*, G. A. Moore, Brockton; *Treasurer*, A. C. Smith, Brockton; *Librarian*, J. H. Weller, Bridgewater.

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PROBLEMS IN MEDICAL SERVICE*

BY WILLIAM H. ROSS, M.D.†

I APPRECIATE the privilege of bringing you a message from the New York Medical Society, as well as the honor of being invited to talk to you this afternoon.

I shall not discuss scientific medicine, although this perhaps is a departure. A good many problems confront the practice of medicine nowadays other than its science. Some solutions must be found for them. To criticise destructively present-day trends of public expectations in health and sickness service will not solve the problems.

Upon assuming the office of President of the Medical Society of the State of New York in June 1930, I undertook to meet its obligations by a study of the situation in medical relationships, in a state of twelve million people living in sixty-two counties, with sixty incorporated county medical societies and eighteen thousand physicians.

Some part has been taken in two hundred medical meetings and conferences. More than two thousand letters from thirteen states regarding medical problems and relationships have been received and answered. Out of it all has come a degree of orientation not expected in the beginning.

I have written an article of the observations of the year for each of the semi-monthly issues of the *New York State Journal of Medicine* and published thirty other articles during the year, regarding medical problems, obligations and relationships. While this study was made in New York it is quite as applicable to other states.

The problems of medical service are interwoven with public relationships. To paint an accurate word picture of present-day public medical associations is a somewhat difficult task because the subject is in a continuous process of adjustment. The influence of coördinated activities on both the practice of medicine and public welfare is beginning to receive thoughtful consideration.

The thinking portion of the medical profession realizes that its affiliations must change as is the case with other conditions. It is a part of inevitable evolution. Medicine is developing a public character. The public is becoming familiar with the services that may be rendered. There is also a tendency of government to accept responsibility for the health and welfare of its dependent citizens.

Certain medical relationships have existed for so long that they have become traditions. Social conditions in other countries have stimulated certain activities there. There is a rapid change in conditions and complexities of society in our own country. The differences in our national life and those of other countries make their plans of medical service unsuitable and unacceptable for this country in many particulars.

There are needs of health and medical service in this country which public opinion is increasingly presenting to the profession for solution. No longer does it suffice just to be a good doctor. There are other problems besides the distribution of scientific medicine.

Though I have extensive notes of the year's experience, I shall not set down isolated facts but rather undertake to write of the indications of the observations and offer them as a contribution to the study of medical problems and medical relationships for whatever value they may have with no thought that it in any way settles anything.

I have approached this study from the viewpoint of forty years in the general practice of medicine with a continuous interest in public health administration but without official connection with it; experience in serving as the head of voluntary health organizations for twenty years and with whatever influences that may have arisen from civic experience in general public welfare,—as a charter member in a civic association in my own community commencing thirty years ago, and the experience gained in finding time in a busy life to serve as the head of a Chamber of Commerce which includes in its activities civic interest in subjects allied to public health in a territory of four and a half million people and whose resources pay thirty-six per cent. of the taxes of New York State.

The problems of medicine are not wholly in its scientific attainments but in its relationships. At this time I do not plan to discuss the science of medicine or its phenomenal growth which in a generation nearly surpasses all of its previous history.

There is some criticism nowadays of all the professions. Medicine has had its share even from some of the intelligent public and in current literature. I have seen many illustrations during the year of the profession's altruism both in public and private service. It seems to me that it is greater than in any other profession. This is evident in all unorganized public opinion and not quite so apparent in the opinion of official and unofficial organizations.

In simpler days there was no difficulty in the distribution of a physician's altruism and there is not today so far as the individual contact of doctor and patient applies. But, since groups work with assembled bodies today, there has

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come to be a large field outside of this individual relationship which has to be met by organization of some kind. The fact that every standing and special committee of organized medicine in New York State this year has advanced into new ground shows that there is developing an understanding that a comparatively new situation confronts medicine. Contacts this year with welfare and civic organizations indicate that there is public expectation that medicine should solve certain problems in health administration and in medical care. This observation applies definitely to certain counties in New York State in which the public, the health organizations, and the profession have met the problems of health and sickness service on a community basis and with united community support.

The year's experience indicates clearly that medicine for its own sake as well as for public needs must work out its own policies toward several activities, like public health education, proper organization for public health practice in the light of modern scientific knowledge for the prevention of disease, the advocacy of whatever laws are needed to do this and to protect the public from untrained advisers in medicine; also to determine the basis of relationship to other health organizations which general opinion today understands. Medicine should consider these matters in order to develop programs of health and sickness service under its own technical leadership.

Organized medicine should assume leadership in proposals for the solution of medical problems, in constructive legislation, in medical education, and in health administration. These things can all be done in coöperation with official and unofficial organizations. Judgment should never be influenced by fear of what may happen in a new relationship. Open-mindedness, until all the obtainable information is gathered, will smooth the way.

The influence of every physician's daily life in subconsciously developing an individualistic habit of thought makes it difficult to change when considering problems involving wider concept than the relationship of a physician and his patient. More and more is the profession being confronted by just this situation.

I have observed this year a growing civic consciousness in medicine just as there has been for some time a growing health consciousness in the public. At no distant time I believe that the profession, as a whole, will see clearly the situation confronting it, and that medicine must do something greater than express destructive criticism in the presence of efforts to license untrained advisers in medicine and to oppose the enactment of new laws for modern public health practice.

The profession should not forget that medicine has a public character and that the public is health conscious—two conditions that did not exist until within a few years. Our individualistic lives may have prevented us from fully realizing this.

There should be between the profession and the unorganized public the same kind of coöperation in all health problems that exists in the tuberculosis control program. I have not known of a single county in New York State opposing the tuberculosis program, notwithstanding that it was sponsored first by official and voluntary organizations and that it is an example of bureaucracy and a complete illustration of state medicine.

Medicine should develop its public policy in order to give every organization and every community a chance to coöperate with physicians in all matters of public health service and in all the problems under the general subject of medical care for all classes. Can medicine do this? I believe it can and will.

I doubt if many physicians have given much thought to or been greatly impressed by changing conditions in our national life and their influence upon medicine, such as means of communication and transportation, good roads, education, and the developments of science.

Dr. Marden, a research engineer, said a few days ago that the wonders of ultraviolet light are just beginning and that this fascinating agent of the scientists is due for a more spectacular sweep into popular use than was expected of radio. In like way, the wonders of medicine in lengthening life, of modern surgery, of control of diseases like diabetes, pernicious anemia, Addison's Disease, and diphtheria; and the prevention of others to come which will involve new organization for their administration should suggest the need of open-mindedness toward new proposals and new laws.

On several occasions this year it seemed that the arguments were received as the product of idealism and of uncertain practical application. But, just as physicians, who are scientific men, accept the doctrine of evolution so will anyone's mind undergo an evolution if applied for a year to the study of any given subject.

I do not speak from observations as limited as I had one year ago but from the impressions following discussions with a large number of medical groups in New York and other states. It seems clear from a year's fulltime study given to the problems of medicine that the pendulum of conservatism and tradition is swinging back from its extreme position of even a decade ago.

In the studies of the year there has been taken into account the changing attitude of the world toward health and sickness problems and it has been necessary, therefore, to avoid such conservatism as would limit this understanding. Perhaps, the studies will be criticized as enthusiastic modernism. Perhaps, they will be characterized as sanely progressive. There has been an effort to apply reasonably practical idealism with existing facts. It seems that there is an

opportunity today for the profession of medicine to occupy a strategic position in public opinion. Apparently public opinion is ready to be directed by the medical profession.

The studies have been logically based on the principles that have guided medicine in New York State from the time when it assumed leadership in medical matters in 1806 and overcame opposition in its first great effort to advance medical science, protect the public from the imposition of those not properly trained in medicine, and to improve public health by enactment for the incorporation of county medical societies.

The progress of the future is always based on the experiences of the past in any given subject. Whatever has gone before furnishes the only safe foundation for efforts to meet new conditions.

THE IDEALS OF ORGANIZED MEDICINE

A review of the history of organized medicine in New York State shows that all the principles for which the State Society stands today were foreshadowed and used in meeting professional problems arising in the different stages of social evolution from the very beginning of the State Society. The accomplishments of the past lend encouragement for the future in efforts to adjust medical relationships to new conditions.

The history of organized medicine shows that there were difficulties even from its very beginning in securing enactments and that forward steps were sometimes strongly opposed and only after they had been tried out did they receive general support.

I suggest that everyone will find, as opportunity offers, the reading of the history of organized medicine in New York State an interesting story. A careful study of the State Medical Society from 1806 will give useful information regarding the ideals of medicine and its practical accomplishments. Its history shows that most of the problems confronting medicine have been settled by the profession. I do not know of a better inspiration as a basis for working out a solution of present-day problems than a knowledge of the history of organized medicine.

The incorporation of medical societies in the State of New York first gave the "Medical Profession an honorable station in the community." It gave the profession "the requisite degree of independence to perform with justice the respective duties expected by the public", in this respect not differing from just that which the Public Relations Committee has been trying to bring about for the last three years.

As a background for many features of this study, I wish to quote the following sentence from the Transactions of the 1807 annual meeting of the Medical Society of the State of New York. "The history of all the learned professions imperiously proves this fact, that no one of those professions has ever become respectable or extensively useful to mankind, that was not under the restraint of the great body of its own members."

With the history of medicine in this State as a foundation in mind there was undertaken a careful study of the relationships of organized medicine:—in the meetings of the district branches, the county societies, academies of medicine, local medical societies, and welfare and civic organizations, attendance at medical, health, and educational conferences; contacts with nearly all the meetings of the standing committees of the State Society. About one-half of these meetings were addressed by prepared talks on different features of medical problems and relationships; in the others, a part was taken in the discussions. These meetings have brought into the open a wealth of information that I would not otherwise have had.

Just as the history of organized medicine in New York State is full of the discussions of medical problems, so the experience of this year shows the problems of today. I believe that they are greater only because society is more complex and greater needs demand increased health and sickness service and a new adjustment of professional relationships so that the profession may use its indispensable influence. Times are changing but not faster in medicine than in all other fields of human effort. Why this is so can be understood if one thinks of the effect of increased density of population in places and diminished density in other places and the general changes in organization and practices and rewards of industry; the tendency in industry to organize its own health and sickness service, to provide pensions, and the evident tendency of government to accept its responsibility for the health of its people shown last year in the establishment of the Public Welfare Law and old age relief.

All these things influence the practice of medicine and make necessary the shifting as to the kind of general practice though not affecting so much special practice. There have been difficulties in the past relatively as great as the present. Medical statesmanship adjusted them and the profession remained the great factor in human progress as it always has been. Exactly similar in principle are the crises in medical relationships today.

Viewed in retrospect there stands out plainly the fact that organized medicine has directed public medical thought in this state for one hundred and twenty-five years and it can continue to do so if it harmonizes its traditions and conservatism to the new social conditions and complexities just as it has done many times before. It would be better for the profession to think these things through as promptly as possible and then be guided by its conclusions. No one

can raise imaginary issues. Whatever the facts are will determine the issues.

Medicine was once in a narrower field. It is now in a broader field. It was once largely curative. It is now increasingly preventive. After all, as the late Dr. Stockton said, "It is simply changing its work from one side of the field to the other."

PUBLIC EXPECTATION REGARDING MEDICAL PROBLEMS

An effort was made to carry to the profession a plain statement of the medical problems due to changing social conditions; the need of adjusting relationships to new conditions both for the benefit of the public and the profession; the need of better organization to meet economic problems; the responsibility for technical leadership in health organizations and for determining the soundness of every health program; to bring about professional understanding that medicine has come to have a public character and that the public has become more health conscious than is generally realized; that the day of isolation in medicine is over; that as the Editor of the *London Lancet* said, "The doctor is no longer the sole repository of medical knowledge"; that "he must take his place in the ranks of other scientific workers"; that "great changes have come in medicine in the past and that a new system of practice could come again"; that the present-day problems of medicine are not scientific but that they lie in its relationships; that the public looks to medicine to solve the problems of health and the problems of modern medical service and care; that medicine should take an active part in persuading departments of health to provide at public expense that which no individual can purchase in the control of such diseases as tuberculosis, cancer, and syphilis; that there should be a better coördination of school hygiene and other health services; that the cure and care of handicapped children can be increased; that the purification of water supplies is the duty of the state; that more attention should be paid to the great problems of industrial hygiene; and that the modern and growing conception that medical service is a basic necessity, which like education must be within the reach of every person at a price to be paid for by the individual who can pay it, and in some way provided for those who cannot.

The observations of the year did not show that there was any problem in scientific medicine. There is a phenomenal growth in medicine and it seems that it could be safely left a little while to the care of medical schools, the graduate education activity of the State Society, the laboratories of medical research, and the scientific sessions of medical societies. There does not appear to be any important problem in the distribution of the modern science of medicine to those able to pay for it. This clears away a part of the general subject of medical problems.

There is doubt of the layman's interest in the pure science of medicine. There is no doubt of his interest in its availability. The layman is not interested in the private business of practice until he needs the service. He is interested in the public service of medicine.

The layman does not always take the intelligent interest that he should in certain well-established disease prevention and public health measures. Even well-educated, intelligent individuals too often resent the physician's suggestion of accepted preventive measures, such as, vaccination against smallpox, immunization against diphtheria, periodic health examinations, and others. Patent medicines are not sold alone to the poor and ignorant nor do cults set up their establishments in the slums. More educational work must be done with the intellectual public before the ideals of the practice of medicine and public health can be realized.

I was able to study some sections of the state better than others in which there had been for some time coöperation with other health agencies, and have heard the local profession talk of the result of coöperation. They have said that the public has had better service because it learned from public health education what can be had in health service and came to the doctors for it, thereby increasing the local practice of medicine. In every community where the profession looks upon medicine as a community problem and has coöperated with other agencies under the leadership of medicine, the public has been better served and medicine has been more prosperous. Organized medicine has advanced just as it has built new pathways of public service, made contact with public interest, and established relationships with them.

The public is rapidly awakening to an appreciation of preventive medicine but, in general, finds little of it applied to individual cases except in spots. We talk a great deal of public health as if its administration were provided for. As a matter of fact, there is more to do than has been done and the next essential is a better organization for its administration.

The better the organization for the administration of public health, the more can be done in public health. If physicians support the expansion of public health facilities and give the technical service, it will mean an expansion of the private practice of medicine. This adjustment should be carefully cared for both in the interest of the public and in the interest of medicine.

There is a great deal going on over the state to indicate that the profession of medicine is the only profession going out of its way today to meet the public criticism. The public is criticizing other professions who have done noth-

ing of account to meet public expectation. If those who say things against the profession of medicine or criticize the service that it renders would use the same effort to help to adjust the present-day complex, social problems before rushing into print and would give the medical profession credit for the substantial contribution that it daily makes to the solution of social problems, far greater results would be obtained than by calling attention to its shortcomings which are also common in all other fields of human effort and in all other professions.

During the year of many contacts with medical societies, the close of the discussions has left me with the thought that common sense would help us to solve many of our problems. If "common sense is the bed-rock of medicine as well as of law", I am quite sure from all that I have learned this year that it is a mighty factor in the solution of the problems of medicine. The union of common sense and "statesmanship" should give us a working basis.

Very much depends upon professional recognition of the trends of public opinion and mainly in two respects. One is a better organization for health administration in order to meet present-day health problems and to use present-day scientific medical knowledge in public health practice. The other is to offer plans that will make modern medical care as available to those whose income is not sufficient to get it for themselves as it is now available in private practice for those who can pay. This may seem visionary but there is a trend of public opinion to try to solve this problem and no group knows as much of how it can be done as medicine.

The farther one goes in a study of the major problems of medicine, the plainer it becomes that they lie in the fields of better organization for the practice of modern public health and the increased availability of modern medical service and care, with some plans for compensation for all professional work either in homes, public health, or service in hospitals. The solution of the problems confronting medicine depends upon the profession using the same conspicuous ability in adjusting its relations to present-day conditions that it uses in its scientific work. It means an effort to apply statesmanship in medical affairs concerning the public and the profession. It means action at the time when public opinion is aroused to the extent of asking for better public health practice and better distribution of medical care to all classes. There is nothing more than these things. It means sufficient statesmanship to see things as they are and to deal with them with relatively the same kind of ability that affairs of government must have. Medical statesmanship has come to the rescue of medicine in the past and it must be used again. Medicine should recognize that a situation exists to which the profession must adjust itself. If it does, the profession will remain the same indispensable essential to all health and sickness service that it has always been.

I have not undertaken to outline in detail measures or plans but to discuss the basic principles upon which plans may be founded.

PUBLIC RELATIONS

No activity of the State Society is doing more for medicine in this state than Public Relations. The committee has led in the solution of many problems and laid the foundation for the solution of others.

I have observed in many parts of New York State this year and have heard many groups of physicians discuss the evidence of the excellent work done by this committee.

Public relations is one of the most vital forces in medicine today. Its value is obvious and more than that, there flows from it an intangible influence that will extend on and on, steadily building up a new professional attitude toward the spirit of conference and coöperation with other influences in meeting the medical needs of the public and in overcoming the economic depression in the practice of medicine.

There is an interest in the value of public relations outside of New York State. It is being discussed in other states as a potentially fruitful force. The public relations work in New York State is being recognized as an epoch making force to bring the medical profession into the leadership that belongs to it naturally, and that it will surely retain if it only plays its proper part in matters pertaining to the public welfare.

There is a rising tide in this work in New York State. Physicians are beginning to see that practice can become more prosperous by coöperation with the objectives of sound programs sponsored by other organizations. There is no better example than the work that the family physicians may do for preschool children as well as school children. Family physicians because of their knowledge of the physical or mental handicaps and the environment of these children should make these examinations. This work has been of striking economic value in each county of the state where it has been carried out. In these counties it has added a substantial amount to the income of physicians; and we must not forget that there is a new crop to examine every year.

I am only using this one illustration but there are others. The work of this committee is an economic asset to medicine.

The Public Relations Committee is largely on new ground. Its accomplishments have grown each year, and mostly where leadership has developed. This is another point on which organized medicine has fallen down. Leadership must possess intimate knowledge of organized medicine and the needs of the family practitioner.

The leadership of the Public Relations Com-

mittee has kept in touch with the public at large. It believes that organized medicine must pay more attention to the needs of the family physician. Leadership must know the needs of the public and the needs of the practitioner. It is apparent to me that we are talking rather too much of the income of the physician without, at the same time, considering the opportunities for a more active participation in the new fields of practice which will improve the economic rewards of the profession.

The interrelationships of the profession, health departments, other departments of the state government having health interests, school hygiene and health services, industrial hygiene and general medical problems arising from the present rapid social evolution have had a great deal of consideration by the Public Relations Committee this year and it plans to extend its influence into a number of fields hitherto untouched next year. The committee is watching every medical experiment in the state. One of them is the Bassett Hospital Guild. The committee will from time to time report the results of these things to the profession.

While the application of public relations to the problems of medicine is only four years old in this state, it grows plainer year by year that the problems of medicine and the problems of the public have a relationship that can be properly adjusted on a partnership understanding. From the drift of how to provide medical service and medical care in other countries, we may anticipate rising public interest in the same question in this country. This is a field for investigation and naturally belongs to the Public Relations Committee. It may involve the reopening of some questions that we have thought settled. It may be as the statement of President Gleason in his presidential report in 1916 that "some form of sickness insurance is inevitable" will have to be considered. It should be thought out and medicine should take the initiative in any proposal on this subject and the Public Relations Committee is the agency to conduct this investigation and present the facts to organized medicine for further consideration.

The Public Relations Committee has given a great deal of consideration to the doctor's relationship to the present activity of many social agencies and to the evidences of the state using its parental function in efforts to meet medical social problems.

Medicine should take an active part in determining the soundness of these efforts, in guiding their establishment if they are to expand, and in furnishing leadership in the technical service field of their administration. Organized medicine should study medical service from these viewpoints and offer constructive plans for improvement.

Progress has been made this year in the practical relationships of medicine to public health. The State Health Department has a better medical viewpoint, I believe, than ever before.

The relationship of medicine was once only that of doctor and patient. Later there came to be groups of medical men still in widely separated areas. Their problems were worked out independently of other areas. Now the interests of each county are interwoven and the profession is so well acquainted and its burdens and problems so well understood that they must be worked out with a sort of coöperative effort.

The medical problems of the public that bear a partnership relation of understanding to medicine and the functioning of official and unofficial agencies have often in some way or other gone wrong and it led to the establishment of the Public Relations Committee as a means of clearing up these difficulties. That the committee has become one of the most useful committees of organized medicine is the proof of the value of the vision of President Fisher of the New York State Society who five years ago suggested the creation of a standing committee on Public Relations.

My observation in many counties throughout the state during the last four years shows that the local profession in many communities has been helped in the solution of its problems both within the profession and in the relationship of the profession to new health problems and new hospital problems. The Public Relations Committee works entirely through the County Societies. It brings the facts to the County Societies and depends upon them to translate their influence to the public and offer them methods of measuring the influence that radiates from the County Society to community problems.

A situation exists in medicine today, due perhaps more to the profession leaving an open field because it has not taken so much care of preventive work as it has of curative work. In the course of time when groups began to work with groups, the individual relationship of doctor and patient no longer answered for the problems of medicine and just as the complexities of society grew and health needs began to be considered and as scientific knowledge of how to meet them became public, social-minded individuals at first and then social organizations and after that philanthropies and still later foundations came into the unoccupied field and began to take part in public welfare. In the efforts to render service mistakes occurred; programs were sometimes unsound; the responsibility of the different groups was not understood; their limitations were not recognized; and there grew up an unfortunate condition that was justly criticized by medicine. These conditions are now the concern of the Public Relations Committee.

A State Society should take care to have the

membership of its Public Relations Committee made up of men trained by experience in the administration of organized medicine and, therefore, able to grasp the problems of medicine. This committee may bring to the surface the technical errors of imperfectly matured health programs as well as at the same time point out the ways of avoiding economic professional disturbance to which no group is immune and which even nations continue to consider.

Personal civic experience for many years in public health affairs and with health agencies and without official connection with health administration, while engaged in the general practice of medicine, has shown that there is a useful relationship between the profession of medicine and the voluntary health agencies. If these organizations will recognize that public health education is its major function, and activate this conception, they will become increasing assets to medicine. A county society that does not modernize its relationships to new conditions may be laying a foundation for economic disturbance of the private practice of medicine. The Public Relations Committee is an available agency to help in the adjustment of relationship to these influences.

I believe that it is generally accepted that scientific medicine has gone much farther in its development than the application of its science has gone in limiting unnecessary illness and in providing adequate medical care for all classes. I believe that it is true that the general profession has not thought much along these lines and yet it is surprising how receptive many groups of physicians over the state are to a consideration of whether organized medicine is exactly in line with public needs today which are so different from even a few years ago and about which every nation in the world today is thinking. The Public Relations Committee is here again the agent of organized medicine.

There is an impression in a great many places in the state that medicine has certain public obligations that have not been clearly met. Should medicine not think this thing through and is there danger that some other agency will do just as has been done in other countries? The best conclusion that I can draw from the opportunities of this year indicates that the relationships of medicine are in a transitional stage, requiring very careful consideration if the virility of the profession is to be maintained.

I believe that an effort must be made on the part of medical societies to harmonize the interests of the physicians and the interests of the public and that physicians should see that not only must the public be served in medical matters but that the doctor should be properly supported while he is rendering such service. I believe that the Public Relations Committee is doing the kind of work that will eventually solve pending professional problems and that will make the profession co-equal in planning programs for health departments and co-equal in the efforts of the state to meet the responsibility for the health of its citizens. A study of New York State this year indicates that when the vision of the Public Relations Committee is fully established, there will be increased professional work to do and economic problems will have diminished. This is just as applicable to all the states as it is to any one of them.

We call doctors colleagues today, never competitors, and we should call health agencies colleagues—not competitors. The medical profession and other health influences are potentially complementary organizations. Both only need to understand the proper relationship and each to understand its limitations and responsibilities.

It never pays to criticize destructively; it always pays to criticize constructively. The relations of organized medicine to the public are of profound importance. It is the real method of solving the problems of medicine and incidentally of keeping professional ideals where every doctor in the depths of his own heart would like to see them.

While there is nothing new in public relations, its application to organized medicine as a means of solving the problems of medicine is new. It is used to harmonize differences of government. It is used in industry and in all civic effort. The principle of conference to settle differences of opinion is an economic asset. The principle of coöperation is sound whenever two groups have the same objective and to which each bears a definite and essential relation.

I believe that the position of the medical profession in the final scheme will be greatly improved as the result of the work that the Public Relations Committee is doing. I believe that there never was a time when there was more need for constructive thought and action on the part of medicine. Preventive medicine has changed the practice of medicine. For example, toxin-antitoxin prevents sickness from diphtheria but as Dr. Meyerding has said, "Prolonging the life of these individuals where diphtheria might have killed, there may follow many other diseases in the same individual that will require treatment."

I have discussed at length the value of public relations partly from my experience in working with the committee for two years and partly from my observation of what it has done in the interest of medicine in several places throughout the State of New York.

PUBLIC HEALTH

Public Health is one of the two essential purposes of medical organization. The first definite indication that public health is the responsibility of organized medicine was at the first meeting of the New York State Society in 1807 when

it offered a prize for the best method of preventing Typhus Mitior Fever.

Public health has always been the concern of nations. It has always been the concern of New York State. Enactments have occurred from time to time as public health needs have become apparent and just as scientific medical knowledge for the prevention of disease developed and just as methods and practices for its administration and distribution became apparent.

Public health in the beginning was advocated and administered by individual practitioners of medicine. It has always been an activity of the medical profession. When public health began to mean more than a police function, just then a new obligation was imposed on medicine.

Public health laws were enacted in this country as early as 1639 in Virginia, 1649 in Massachusetts, 1665 in New York and New Jersey, and a National Health Law in 1796. Philadelphia in 1793, Baltimore in 1793, New York in 1796 and Boston in 1799 had Boards of Health and a health officer.

Although discussion of official organization for the administration of public health began more than eighty-five years ago and a law was enacted to carry this into effect in 1850 in New York State, most health departments as functions of government are only about fifty years old. There were major health laws enacted to meet new health needs in 1880, 1890, 1900, and 1913 in New York State and in other states.

Essentially, however, we are dealing with a comparatively new relationship of medicine and public health practice. The health laws met the needs of health administration at the time they were enacted and new laws came into existence only because of changing health needs, the development of scientific medical knowledge, and new methods of public health practice. All these laws were mandatory and were accepted as sound procedures to meet existing conditions at the time of the enactment of each one of them.

As the complexities of society and health needs increased, social organizations came into the field to help in meeting health problems for which there was no organization and no appropriation at the time. That mistakes occurred is a fact. Mistakes, however, are the usual experiences of mankind. The "cut and try" method has never been entirely eliminated. The needs of public health today can be worked out and the situation understood if we interpret the facts without emotion.

I believe that we all see that the practice of medicine is in a period of active transition. It is equally true that the relationships of medicine to public health practice are in a state of active transition, due to changing needs, increased knowledge of how to prevent disease, and new methods of applying public health practice. If it is true that the greater the mind of man, the more he seeks for truth uninfluenced by lesser things, then we as a body of educated men should overcome our justified reactions to past occurrences as guides in thinking out the next forward step in public health organization and present knowledge of public health practice.

None of my studies of the year has shown any facts sufficient to convince me that medicine is under siege or that there are intended onslaughts on medicine. Medicine is too essential to human welfare to think of these things seriously.

While the practice of medicine is the very foundation of public health, the state must furnish certain equipment, organization, and personnel for public health practice in mass or semi-mass ways. This is not state medicine and need never be unless the indifference of practitioners of medicine permits it to become so.

We all know that the technical service of medicine is absolutely indispensable in any health program and medicine can direct the movement if it will, simply by directing the early phases of any organization. While it is true that there is an increasing participation of the laity in the public health field, the reason for it is that there are unsolved health problems that depend for their solution upon supporting organizations. Foundations have pioneered in medical research and in medical education. They have brought to light unsolved health and medical problems. The work of the Rockefeller Foundation, for example, is a public asset and in coöperation with the medical profession is an economic asset to medicine because to meet the problems that this foundation has brought to light requires medical practice. The work of foundations commands public confidence and the public is beginning to ask that the health problems found shall be met.

There are places in New York State where medical opinion seems to be opposed to public opinion and if so we should consider whether that is an entirely sound situation. In some places in this state I have been told that the state has no right to do such things as to hold an immunization clinic conducted by a doctor in the employ of the state, even though in certain other parts of the state this is a common practice.

It is doubtless true that there is an enlarged conception of the need today of a new public health program in every state. If so, it is in line with the changed front of mankind toward disease and perhaps the reason for this lies in the present public character of medicine and the knowledge of what can be accomplished by health service, aided, of course, by better living, shorter hours of labor, and more opportunity for education both in schools and by such agencies as the millions of automobiles that run everywhere and the use of ten million radio sets, making it possible for a million people to hear discussions now as well as one hundred could a few years ago.

The profession should think through without emotion and without being influenced by any mistakes of the past its policy toward many features of these relationships. One of them is that of organization for the practice of public health. Of course, we must expect that philanthropies and foundations will continue to advance health and medical projects. It is proper for them to do so. It is also proper that medicine should at the same time take an active interest in the advent of any health proposal. Civic effort is as applicable to medicine as to government and it would be just as disastrous to one as to the other if it were blotted out. World problems are being solved today by civic effort that would not otherwise be elucidated.

The medical profession rightfully objects to the free distribution of measures to prevent disease for those people who can afford to pay for it. In New York State this principle has been insisted upon in conferences with the State Department of Health in all of its programs and the State Department of Health has accepted this principle as a guide in all of its programs.

FUTURE POSITION OF MEDICINE

If thought of the problems of medical service has been stimulated and if a vision of medical relationships for the future has been enlarged and brought a little nearer to every-day thought, the work in New York State this year will have accomplished one of the things that it set out to do. There are medical problems to be solved. There are evidences of an increasing statesmanlike attitude toward them. It shows here and there all over the state and prompts one to believe that there is just ahead a certainty that the greatness of the profession of medicine still lives.

The future position of medicine will rise or fall largely by its relation to the state of public opinion regarding the great problems of health and sickness service—America's greatest problems—and professional attitude toward their solution and toward coöperation with other agencies possessed of resources to meet public medical problems arising from the present-day rapid, social evolution. Sooner or later public opinion will make decisions regarding better administration of public health and increased availability of adequate medical care and medical service. The public expects the medical profession to plan for this. Medicine should meet this expectation.

If medicine would survey its public relationships as a whole, it would give a better understanding of the situation in medicine than if the problems of medicine are considered separately. Single problems can easily be distorted or seen out of proportion.

I have undertaken in this discussion to summarize the medical activities that have been carried on by organized medicine in New York State this year.

My opinion is that present-day medical attitudes are sound. There is a growing understanding that coöperation of all health influences is a sound procedure when their limitations and responsibilities are recognized. There is a new consciousness on the part of the profession, of public officials, and of the people. I have seen many evidences of it in New York State and many evidences of interest in other states this year.

CAT-NAPS

The following editorial from The Boston Transcript is of sufficient interest, we feel, to warrant republication.

A learned New York doctor, in a recent lecture to the girls at Barnard College, warned them against losing their beauty sleep. He told them that when their regular nightly portion of slumber had been broken or curtailed they should make up for it with cat-naps on the subway journeys to and from home. He did not explain how one can hang to a subway-car strap and enjoy a refreshing sleep at the same time, but the New Yorker has learned to adapt himself to many conditions which seem intolerable to those who live in less compact communities.

The basic idea, of course, is not new. Napoleon was supposed to get along with four or five hours' sleep a day, but he used to drop off and doze for long stretches during his travels in his coach. Many of us, imitating Napoleon in this practice, go to sleep regularly every evening on our train ride homeward to the suburbs, and some give themselves up so completely to rest that the calling of their station does not rouse them, and they only wake up somewhere in the wilds of Plymouth County, far from the madding crowd, but mad, nevertheless, as they pace the platform of the lonely station and listen to the taunting notes of the whippoorwill. A safer way to make up for lost sleep is to follow the practice of a Boston philosopher who, after a night spent in walking with the infant Samuel or in deep mathematical calculations, steals off in the middle of the day to the movies, and there sweetly sleeps, lulled to repose by the rat-tat-tat of machine-guns in a play of the underworld. He confesses that he was greatly annoyed when the talkies superseded the silent films, and for a while his rest in the picture theatres was broken. But he has now got used to the noise and finds that as a soporific it is quite as effective as the organ music used to be. He scouts the idea that any man gets along on less than eight hours' sleep out of the twenty-four. Men, he says, and still more women, come down in the morning and tell you that they haven't had a wink of sleep all night when they have simply dreamed that they lay awake. It is a very common form of self-delusion.

NEW ENGLAND HEART ASSOCIATION

METHODS OF CARDIOVASCULAR STUDY BY THE ROENTGEN RAY*

BY HUGO RÖSLER, M.D.†

IMMEDIATELY following the great discovery by Roentgen, x-rays found application in the study of the heart and great vessels. This method had to fight for its acknowledgment like any other new method, and even in 1908 Mackenzie wrote in Osler's Medicine "Indeed I am doubtful if any x-ray examination of the heart has ever thrown the slightest light upon any cardiac condition." To disregard the x-ray examination means to neglect our best trained sense, the eye. The x-ray examination of the heart and great vessels offers much concerning anatomy, physiology, and pathology. We are enabled to study, up to a certain degree, the position, size, and shape of the heart, of each of its chambers and of the great vessels, namely, aorta, pulmonary artery, and superior vena cava. There is added the study of the pericardium and finally we may learn much concerning the relation of the heart to the adjacent organs and regions, lungs, diaphragm, and mediastinum. Furthermore, cardiac pulsation and rhythm should be studied. The chief value of cardiovascular x-ray examination is in the case of the following conditions:

1. Emphysema, thick or deformed chests, and other thoracic diseases. (By detecting changes which by clinical methods are not found at all or not easily found.)
2. Dilatation of the left auricle.
3. Calcification and dilatation of the descending aorta.
4. Thickening and calcification of the pericardium.
5. Malformations.
6. Diseases of the pulmonary arteries.
7. Lung stasis in cardiac decompensation. (To determine the degree.)
8. Luetic aortitis. (For diagnosis.)

The methods we use will now be briefly outlined. Their application and the results so obtained will be discussed by the speakers to follow. The method of choice in the x-ray examination of the cardiac patient is to start with fluoroscopy and then to proceed to take teleroentgenograms or orthodiagrams or both. Examinations never should be limited to the anterior view only, but should consider oblique and lateral views also. In the fluoroscopic examination the heart and great vessels including the whole chest are studied on the fluoroscopic screen. It may be well to discuss shortly how long we may continue an x-ray examination without fearing damage to the patient's skin. Using a current of 4 to 5 milliamperes and an aluminum filter, turning the patient around, and handling the x-ray diaphragm, we may if necessary transilluminate the patient for an interval up to ten minutes. The tube is situated about

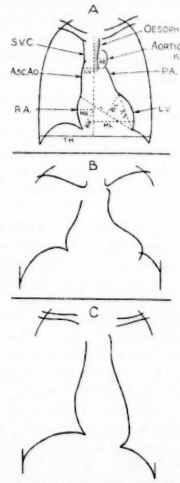

FIGURE 1. Orthodiagrams of normal heart in anteroposterior position. A in subject of average build, B in subject with high diaphragm giving rise to horizontal heart position, C in subject with low diaphragm giving rise to vertical heart position. S.V.C. = superior vena cava, Asc.Ao. = ascending aorta, R.A. = right auricle, P.A. = pulmonary artery, L.V. = left ventricle, AO = aortic diameter, GV = width of great vessels, MR = distance from midline to right border of heart shadow, ML = distance from midline to left border of heart shadow, L = long diameter of the heart, BR+BL = diameter of the heart across the base, LV = left ventricular arc.

(From P. D. White, *Heart Disease*, Macmillan Co., 1931.)

two feet behind the patient's back. A greater distance requires more x-ray energy and makes the manipulation more complicated. Due to the divergence of the x-rays, magnification of the heart and great vessel shadow results, and the proportion between the width of the heart and the width of the chest is disturbed also.

We begin with the anterior view. The patient faces the observer and leans his anterior chest wall against the screen. After careful examination of the heart and great vessels, the action of the diaphragm is noted, along with the effect of deep inspiration and expiration; the

*Read at the third meeting of the Cardiac Course, New England Heart Association, Boston, January 7, 1931.

†Rösler—Travelling Fellow of the Rockefeller Foundation 1930-1931. For record and address of author see "This Week's Issue," page 111.

condition of the lung shadows and hilus is also investigated. Then the patient is rotated so that the right and later the left, anterior side of the chest wall touches the screen. These are called respectively the right and the left anterior oblique positions. The rotations may be carried further to the lateral and posterior positions.

One of the chief values of fluoroscopic study lies in the study of the pulsations. Although the diagnosis of disturbance of the heart rhythm by x-ray is much less accurate than by electrocardiogram, we are able to diagnose several conditions, provided we limit our diagnostic work to the cases with rather slow rate. Then it is quite easily possible to diagnose partial and complete heart-block, auriculoventricular rhythm, extrasystoles, and auricular fibrillation. Absence of pulsations along the heart contours helps us in diagnosing contracted pericardial adhesions. A certain type of pulsations characterizes the heart found in hyperthyroidism.

In order to have a record of our examinations there should be added an orthodiagram or an x-ray photograph (teleroentgenogram) of the heart. An orthodiagram is a tracing taken of the shadow of the heart and great vessels outlined against the fluoroscopic screen by the central rays from the x-ray tube. If, the tube is only a short distance from the patient, the whole beam of the x-rays follows, as previously mentioned, a divergent course, and everything is then distorted. If by using a diaphragm which is connected with the tube, all but the central rays are excluded, we then deal with a bundle of approximately parallel rays. The tube is now movable independently of the screen and will be shifted so that the central rays follow the outline of the heart and great vessels. These outlines are drawn directly as lines on the fluoroscopic screen with a special pencil. In the same way the contours of the clavicles, chest wall, and diaphragm are drawn. From the fluoroscopic screen a copy on transparent paper is made and kept for permanent record. Orthodiagraphy is not difficult but can be done in a satisfactory way only with practice and experience. Then it is an accurate method, allowing exact determination of the position of the apex and of the junctions of the auricles, great vessels, and heart. Finally, it is the less expensive method.

A teleroentgenogram of the heart is a record on photographic film. In routine use, the distance between tube and chest is seven feet. At this distance the divergence of the x-rays though still present, is not great, so that the resulting error is not very large. However, the excess of transverse diameter of the heart over the true size may reach about 12 per cent. and the magnification is still more evident in the measurement of surface area. As previously mentioned, the use of oblique positions is of great value, and therefore we take pictures in oblique positions also.

How great should be the angle of rotation for the oblique positions? This question cannot be definitely answered. The angle varies from 30 to 70 degrees. It is more advisable not to choose a certain angle but to depend upon the fluoroscopic findings. That degree of rotation in which the most satisfactory view is obtained is borne in mind and a film is taken at the same angle. The exposure time should be as short as possible. This requires a rather powerful outfit. In special cases the Bucky technique is used, which, briefly summarized, gives better contrast (the well-known gall bladder and vertebrae pictures are taken with this technique). Calcification within the heart area can be demonstrated much better by this technique than otherwise.

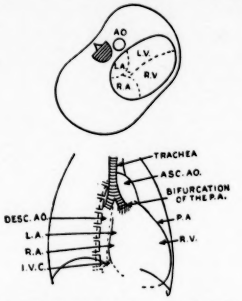

FIGURE 2. Orthodiagram of heart in right anterior oblique position with diagrammatic representation of cross section of chest and heart above. The heart is magnified to show more clearly the chambers. Abbreviations as before, and in addition L.A. = left auricle, DESC.AO. = descending aorta, I.V.C. = inferior vena cava.

(From P. D. White, *Heart Disease*, Macmillan Co., 1931.)

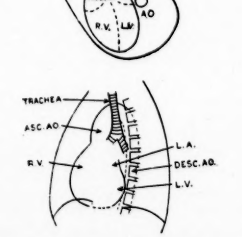

FIGURE 3. Orthodiagram of heart in left anterior oblique position. Above is shown a diagrammatic representation of the cross section of thorax and heart with the heart enlarged to indicate more clearly the heart chambers.

(From P. D. White, *Heart Disease*, Macmillan Co., 1931.)

The advantages of the teleroentgenogram are as follows. It is an objective record, and, pro-

vided the technique is accurate, it is less liable to subjective sources of error than the orthodiagram. It includes all other chest conditions also. It outlines more clearly the hazy borders. It can be carried out by a technician. It is the better method to follow changes in the size of heart and aorta over a long period of time for purposes of comparison. The disadvantages are the expense and the fact that often neither the cardiac apex nor the exact junctions of the auricles, great vessels, and ventricles can be shown.

Finally cinematography has been used in the x-ray study of the heart. The methods being used are very complicated and expensive. The most practical way in the future will be cinematography of the picture as it is seen on the fluoroscopic screen.

One should not omit examination of the oesophagus by means of a barium mixture. The close relation of the oesophagus to the aortic arch is an aid in the measurement of the aortic arch. Its relation to the posterior wall of the left auricle is an aid in the diagnosis of enlargement of the left auricle; and the study of the oesophagus is furthermore of help in diagnosing aneurysm of the descending portion of the aorta.

Errors obtained in using the x-ray method of study of the heart and great vessels may be classified in the following three groups:

1. Lack of personal experience.
2. Lack of knowledge of the natural limitations of the method.
3. Lack of adequate technique.

Examples may illustrate these points.

1) Anatomical examinations have shown that in otherwise healthy people of about the same size and body weight, the circumference of the aorta and the heart weight may vary considerably. Therefore a rather wide range of variation is seen in the x-ray examination, and only after having seen a large series of normal cases and especially having taken into consideration the constitutional type is it possible to learn what is "normal". Attempts to compare each case with the normal standard limits by using extensive tables of formulae may give us a false sense of security, and furthermore we do not even have any rules concerning the whole activity of heart and great vessels as shown in fluoroscopy. To the inexperienced, a picture of congestive lung failure may easily impress one as miliary tuberculosis, or a dilatation and sclerosis of the pulmonary artery may impress one as a swelling of the hilum glands due to metastases.

2) Little can be gained if we base our judgment of the power of the heart muscle on fluoroscopic examination. We see only the pulsations along a part of the outlines of the heart; we miss entirely the motion of the A-V septum, caused by contractions of the papillary muscles. There may arise a question of a heart aneurysm in a case with clinical signs of coronary occlusion. As we see the heart and the great vessels because their specific gravity is higher than that of the surrounding lungs, and since no difference in specific gravity is given between heart and liver, we therefore will not be able to diagnose an aneurysm of the heart bulging into the liver surface; and as the muscle of the heart and the blood in the chambers have about the same specific gravity, an aneurysmal thinning of the wall of the heart muscle will not be seen in the film unless a bulge along the outer contour takes place.

3) Finally, using only the anterior view in our examination, we may miss enlargement of the left auricle or arteriosclerosis of the descending portion of the aorta or erosion of the vertebrae due to aneurysm of the descending aorta.

One may generally say that in disease very early changes may not be, and very often cannot be, diagnosed by x-ray examination.

In closing I would like to offer the following point for discussion: Who should perform the x-ray examination of a heart case? There is no doubt that if one man can handle all diagnostic methods, he should do it, but rather few men in internal medicine, specialists as well as general practitioners, have a training in x-ray examination and if so it is mostly insufficient; on the other hand, many x-ray specialists are not enough acquainted with the clinical problems of heart and vessel diseases. It seems that the internists who have some x-ray training should do the fluoroscopic examination of these heart cases and they certainly will be very much satisfied with it. Even a small x-ray outfit is, however, rather expensive, and actual photography is not only often very useful in heart and great vessel conditions, but absolutely necessary for conditions of lungs and bones, which may be present in the cardiovascular cases. Such photography needs an equipment and broader experience which as a rule only the x-ray specialist can offer.

ROENTGEN STUDY OF THE HEART*

BY MERRILL SOSMAN, M.D.†

IN choosing the specialty of cardiology from the other branches of internal medicine, you have chosen well, when it comes to analyzing the final results of diagnostic acumen. You are fortunate because the Lord has given you certain definite, specific heart sounds by which you can judge your patients with greater accuracy than tient with an extremely rapid heart rate, probably due to auricular flutter, in whom it was said the doctor calculated exactly how long the patient could live with his heart going at that rate.

Most of the other specialists in the branches of medical practice need our apparatus to help them in their diagnoses in the majority of their

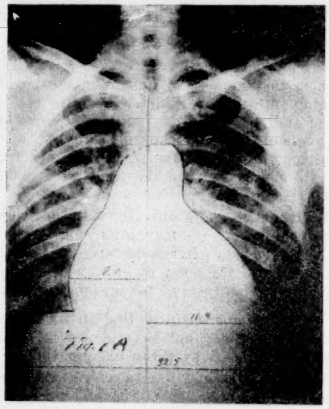

FIG. 1 A. Pericarditis with effusion. Note congestion of lungs.

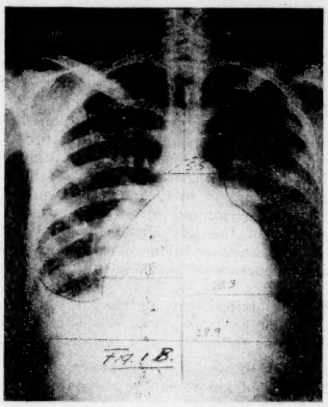

FIG. 1 B. Decompensated heart (mitral disease), simulating pericardial effusion in its outline. Note mitral fullness.

can men in other branches of internal medicine. From my experience I would say that your percentage of accuracy in the diagnosis of valvular heart disease is greater than in any other similar section of medicine. Not only have you an easy anatomical test by the sound of the heart, but you also have a ready test of function by the action of the valves, by time relations, by blood pressure, by electrical activity, and by response to ordinary or unusual exertion. In view of this and with your equipment of stethoscope, electrocardiographic machine, and sphygmomanometer, I can say frankly that you do not need a roentgenologist or his magic lantern in the handling of your routine cases. Your diagnoses in the anatomical lesions of the valve are extremely accurate as I have seen them, and it is almost as accurate as to the etiological and functional changes with one marked exception,—that of chronic adhesive pericarditis. The field of prognosis, however, is still quite uncertain in angina pectoris, for example, although I have recently heard across the bridge table of a patient with a pericardial effusion in its outline. Note mitral fullness.

cases. The gastroenterologists would practically be lost without the x-ray equipment; in gall bladder work, the newer functional tests using the x-ray have made anatomical as well as functional diagnosis almost an exact science; the x-ray is of inestimable value in the diagnosis of pulmonary diseases, particularly tuberculosis; even the renal surgeon would be badly handicapped without his double-barreled diagnostic gun, the cystoscope for the first barrel and the x-ray for the second.

My ideas as to the cardiologist's accuracy may be exaggerated due to my close association with Dr. Levine, whose work has given me the highest regard for your specialty. It is with considerable timidity, therefore, that I attempt to tell you anything this afternoon. Let me say first that I feel that the stage of warfare has passed, the day when we spoke of the stethoscope versus the x-ray. It is no longer an idea of competition but rather one of coöperation:—of how much help can the x-ray be in the diagnosis of a given case, and my efforts now will be to show, if I can, where, when, and how we can be of help.

As a major premise, let us consider that you make or want to make a threefold diagnosis in each pathological case, first, anatomicopatho-

*Read at the third meeting of the Cardiac Course, New England Heart Association, Boston, January 7, 1931.

†Sosman—Roentgenologist, Peter Bent Brigham Hospital. For record and address of author see "This Week's Issue," page 111.

logical, such as mitral stenosis; second, etiological, such as rheumatic heart disease; third, functional such as decompensation, and auricular fibrillation.

Considering the anatomical phase of diagnosis first, I am sure you will agree with me that we can give you a delineation of the size and shape of the heart more accurately than you can get it by any other method. In other words, x-ray can supplant percussion any time you want it, if you want that information. For instance, in deciding whether heart disease is present or not, a demonstrable enlargement is definite evidence in favor of a diseased heart. Of more value, probably, are serial x-ray examinations recording any changes in the size or shape of the heart that may ensue from time to time. May I mention here Dr. Gordon's work on cases of acute decompensation where serial x-ray examinations were made with the patient in a fixed position and a special bed, demonstrating a definite decrease in the size of the heart as the patient's condition improved. A similar demonstration has been made in cases of myxedema, also showing that the heart decreased definitely in size as the patient improved under the feeding of thyroid extract. The x-rays will also supplement the inspection of the patient, and this is chiefly true when the patient is well enough to be fluoroscoped. It is by this method that we are most apt to notice calcification in the heart or pericardium which is the only reliable sign that I have observed in the diagnosis of chronic adhesive pericarditis. The other signs of chronic pericarditis by fluoroscopy are: (1) a triangular shape with loss of smooth contours, (2) an indistinctness in outline, which presupposes also pleuropericardial adhesions, (3) an indistinct beat without the normal a-v differentiation usually seen; (4) fixation of the heart to the diaphragm, with a tug on the diaphragm at systole; (5) fixation of the heart to the chest wall so that the heart rises with inspiration. This last-named finding is due to a mediastinitis and not to pericarditis uncomplicated. All these signs have been found to be false one or more times, but not so calcification.

As to the second step, etiological diagnosis, we can offer you very little help from the x-ray examination and, as a matter of fact, you can make very little in the way of an etiological diagnosis from your physical examination, as this depends largely on the history of the patient or on inductive reasoning, i.e., you find mitral disease in a youth of twenty and you reason from experience that it is of rheumatic origin. It seems to me that the history, well and carefully taken, is the most important single method of diagnosis of disease in the human being, with the possible exception of that part of your specialty, valvular heart disease, where the stethoscope is undoubtedly of greatest importance. The single exception in this broad statement is syphilitic heart disease (aneurysm and possibly aortitis), where we can give definite help, as Dr. Sproull will show you.

In the third step, diagnosis as to function, it seems that aberration of function is usually quite evident from observation of the patient. The x-ray may help in these cases by showing the effects of decompensation,—pulmonary congestion or fluid; and I would again emphasize that the fluoroscopic examination is of greater value here than is the film method, as mobility of the heart, the character, form, propagation, and force of the heart beat may be studied by

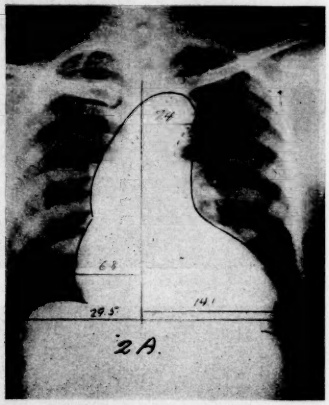

FIG. 2 A. Aortic regurgitation, 10 years' duration.

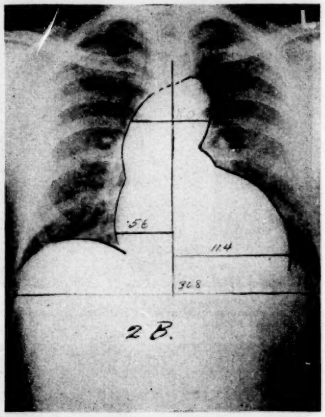

FIG. 2 B. Hypertensive heart disease, B. P. 240/130, simulating aortic valve disease.

this method. The second oblique view (left shoulder forward) so that the apex of the heart just clears the shadow of the spine, is the best view for an estimation of myocardial power and efficiency, and visibility may be improved by a deep breath slowing the heart for better inspection. Thus you may note the crawling weak beat of a myocardial degeneration, the forceful rocking beat of aortic regurgitation with the quick collapse of the aorta, the rapid floppy beat of hyperthyroidism, or the somewhat similar hyperactive beat of anemia. Hypertension gives a sustained beat and the apparent power appears less than you would expect, probably due to concentric hypertrophy which masks the beat, as it were. The pulsation of the aorta in hypertension is usually much more marked than the ventricular pulsation. In short, fluoroscopy gives the trained observer a good idea as to the type and efficiency of the myocardial impulse.

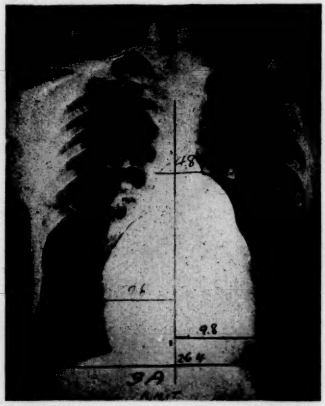

FIG. 3 A. Combined valvular disease, aortic, mitral, and tricuspid, with prominence in area of pulmonary conus suggesting congenital heart disease.

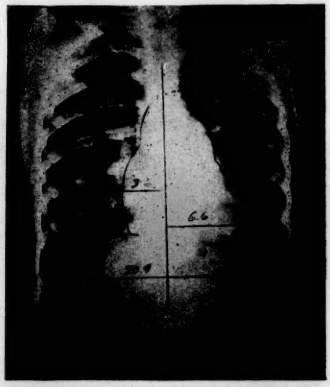

FIG. 3 B. Congenital heart disease.

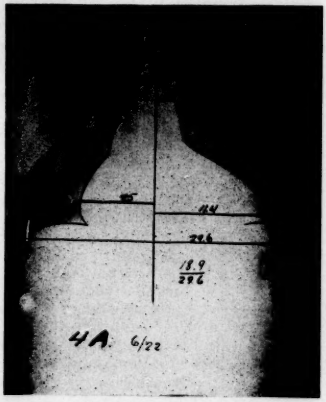

FIG. 4 A. Myxedema heart before thyroid feeding.

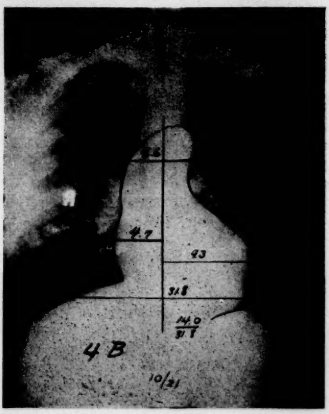

FIG. 4 B. Same heart 4 months later after feeding thyroid gland extract.

SUMMARY

We, as roentgenologists, can help you, as cardiologists, in three ways. (1) We can give you the exact size and the shape of the heart and make permanent records for future comparison; (2) we can obtain an idea by fluoroscopy as to the character of the heart beat and

the condition of the myocardium; (3) we can identify isolated conditions such as aneurysm, calcified pericardium, Hodgkin's disease, or other mediastinal tumors which may help in your diagnosis. May I emphasize that x-ray examination is called for particularly in doubtful or uncertain cases, and is not necessary in the well-established cases of valvular heart disease, except for permanent records of size or evidences of a complication such as pericarditis.

(Dr. Sosman then demonstrated by means of lantern slides the standard positions for radiograph, the typical deformities of valvular lesions, the secondary pressure effects of cardiac enlargement on the oesophagus and trachea, and showed how different diseases, defects, or anomalies might result in the same change of cardiac outline.)

ROENTGEN STUDY OF THE THORACIC AORTA*

A Summary

BY JOHN SPROULL, M.D.†

ROENTGEN study of the great vessels involves primarily roentgen study of the thoracic aorta; there has been relatively little roentgen study of other great vessels. In this paper the thoracic aorta only will be considered.

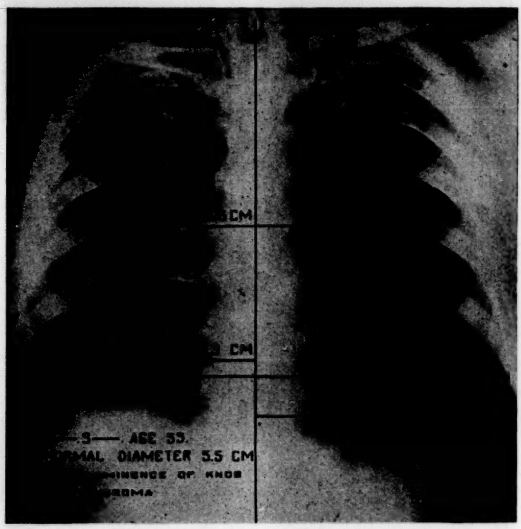

FIGURE 1. Normal aorta. Posteroanterior view.

It is a fact easily verified, that in suburban roentgen practice, but few cases are referred for roentgen study of the heart and great vessels. Assuredly patients with symptoms suggesting disease of the circulatory system are not referred for roentgen study in such proportion as are those presenting symptoms indicating disease of either the digestive or respiratory systems. Two principal reasons probably account for this situation:

(1) Many practitioners and cardiologists feel competent to diagnose cardiac and aortic disease without the aid of roentgenology.

(2) The information which may be obtained from a properly conducted roentgen examination of the heart and great vessels is not well known to the rank and file of the profession.

Conditions and symptoms which should suggest the need of roentgen examination of the aorta are:

1. Angina pectoris.
2. Paroxysmal dyspnoea, especially nocturnal.
3. Substernal distress not anginal in character.

*Read at the third meeting of the Cardiac Course, New England Heart Association, Boston, January 7, 1931.

†Sproull—Roentgenologist to the Hale Hospital, Haverhill, Mass. For record and address of author see "This Week's Issue," page 111.

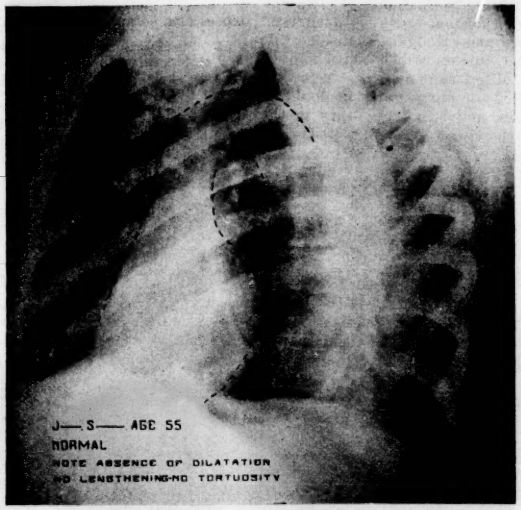

FIGURE 2. Normal aorta. Oblique view. Note the normal curve of the aortic arch.

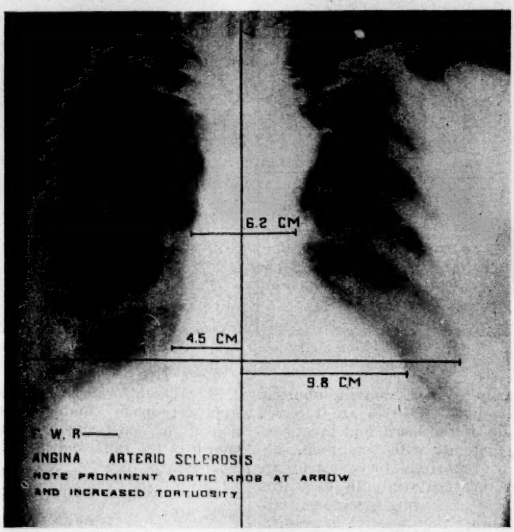

FIGURE 3. Arteriosclerosis. Posteroanterior view. Note the prominence of the aortic knob at the upper left part of the aortic shadow, also the increased tortuosity of the aorta.

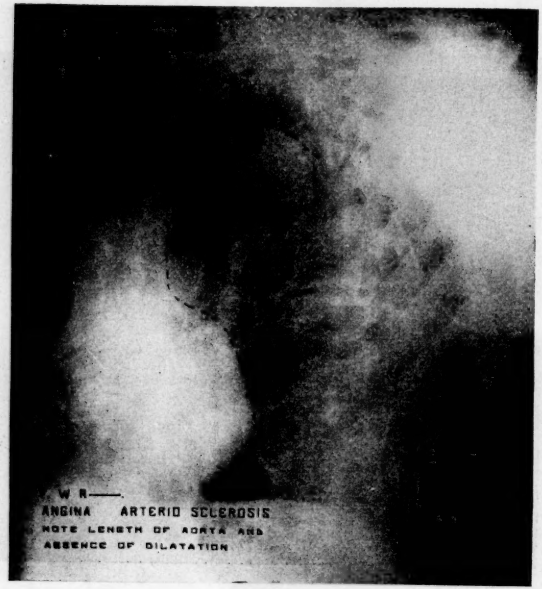

FIGURE 4. Arteriosclerosis. Oblique view. Note the lengthening of the aortic arch. Compare with Figure 2.

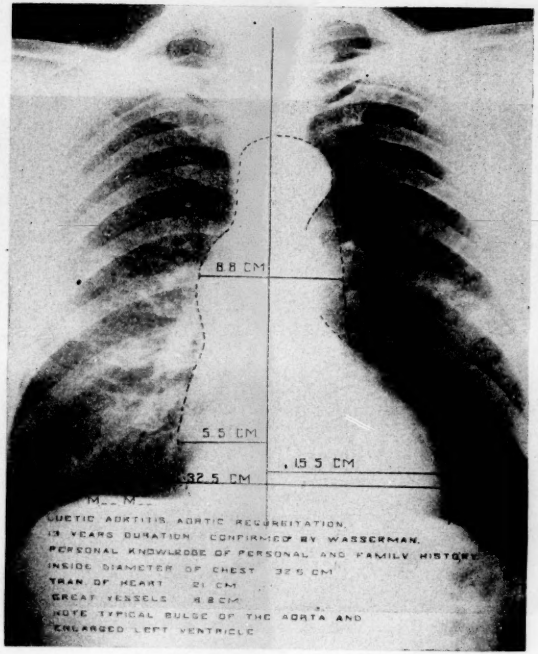
8.8 CM
5.5 CM
15.5 CM
32.5 CM
LUETIC AORTITIS, AORTIC REGURGITATION.
13 YEARS DURATION CONFIRMED BY WASSERMAN.
PERSONAL KNOWLEDGE OF PERSONAL AND FAMILY HISTORY
INSIDE DIAMETER OF CHEST 32.5 CM
TRAN. OF HEART 21 CM
GREAT VESSELS 8.8 CM
NOTE TYPICAL BULGE OF THE AORTA AND
ENLARGED LEFT VENTRICLE

FIGURE 5. Syphilitic aortitis. Aortic regurgitation. Posteroanterior view. Note the expansile bulge of the right border of the ascending aorta, the increase in the transverse diameter of the great vessel shadow, and the enlargement of the heart chiefly in the region of the left ventricle.

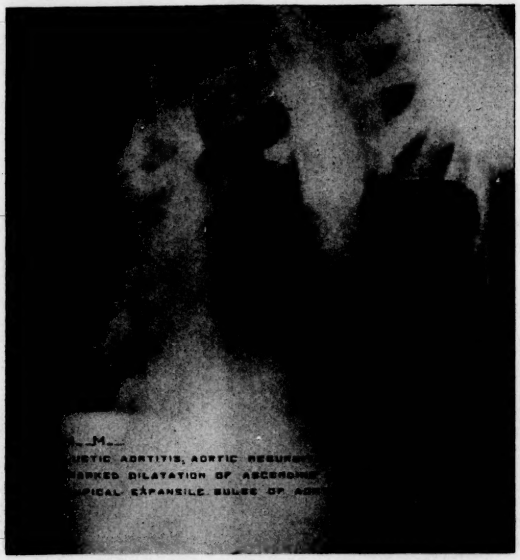

FIGURE 6. Syphilitic aortitis. Aortic regurgitation. Oblique view. Note the expansile bulge of the ascending aorta well shown in this view, also the marked dilatation of the ascending aorta.

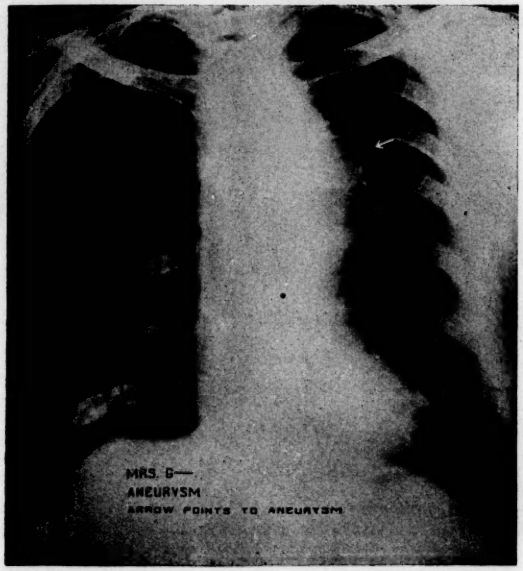

FIGURE 7. Aneurysm of the descending aorta. Note the convex tumor-like expansion to the left of the upper portion of the aortic shadow.

4. Unexplained cough, especially if unproductive.
5. Unusual pulsations.
6. History of precedent syphilis, especially in middle-aged persons.
7. Evidence of disturbed cerebral circulation not explained by other methods of examination.
8. At times hypertension.

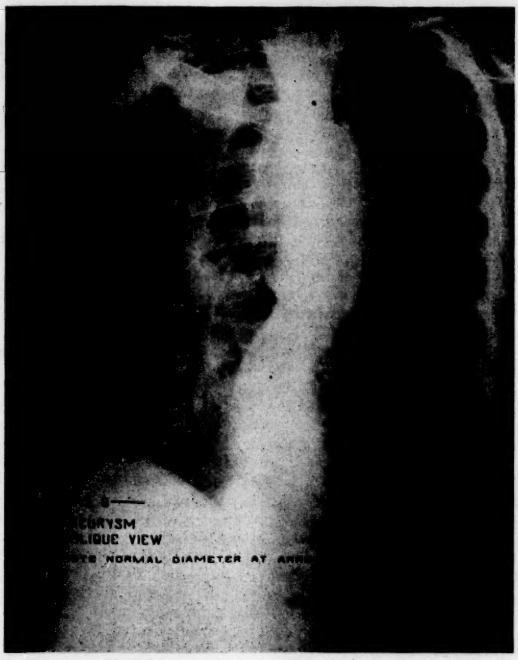

FIGURE 8. Aneurysm of the descending aorta. Oblique view. The fusiform dilatation of the first portion of the descending aorta is well shown. The normal diameter of the descending aorta can be seen distal to the aneurysm.

9. Aortic valve disease, especially aortic regurgitation.
10. Atypical unexplainable cardiac conditions.
11. Heart block, especially in middle-aged persons.

THE ROENTGEN EXAMINATION

The roentgen examination should consist of a combination of fluoroscopic and radiographic methods, with special emphasis on the fluoroscopic. Films, however, should never be omitted in a *complete* roentgen examination, and these should include posteroanterior and second oblique views.

CHARACTERIZATION OF THE NORMAL AORTIC SILHOUETTE AND SHADOW

1. It should be regular in outline, and should present no unusual expansions or contractions.
2. There should be no unusual prominence of the aortic knob.
3. There should be no areas of calcification indicating atheroma.
4. The shadow should be of normal density.
5. The combined shadow of the ascending and descending aorta, in films taken at a distance of seven feet, should not measure over 6 cm. in diameter, except where there is an unusual anatomical relationship of the ascending and descending parts of the aorta, which condition should be visible either on fluoroscopic examination, or on films taken in the second oblique position.

COMMON CONDITIONS PRODUCING CHANGES IN THE AORTA, AND THEIR CHARACTERISTIC ATTENDANT ROENTGEN CHANGES

1. Arteriosclerosis.

The characteristic roentgen changes in arteriosclerosis are: (a) increased visibility of the aorta as a whole, (b) increased prominence of the aortic knob (better seen in the postero-anterior view), and (c) increased tortuosity and lengthening of the arch of the aorta (better seen in the oblique view). Atheromatous plaques are occasionally seen.

2. Hypertension.

The aortic roentgen findings in hypertension may be classified under three headings:

(a) No aortic change, that is, the aorta appears normal.

(b) The findings are those of arteriosclerosis.

(c) There may be seen moderate general dilatation of the vessel.

3. Syphilitic Aortitis.

The roentgen changes usually observed in syphilitic aortitis are:

(a) An expansile bulge of the right border of the ascending aorta occurring just above the silhouette of the right auricle.

(b) Dilatation of the aorta, commonly limited to the first portion or ascending aorta, but which may involve any part or the whole of the aorta.

(c) Lack of prominence, or flattening, of the aortic knob.

Syphilitic aortitis may be associated with hypertension or with atheroma. This should always be borne in mind, for the aortic appearances are then the composite result of two diseases. This coincidence of syphilitic aortitis and either of the two diseases mentioned makes the diagnosis more difficult, but not impossible, provided the coincident occurrence is known to the examiner.

4. Aneurysm.

In aneurysm of the thoracic aorta, the roentgen findings are those of a symmetrical tumor-like dilatation of the aortic silhouette. There is usually, but not always, expansile pulsation present in the tumor. Pulsation of itself does not prove the tumor to be aneurysm, for pulsation may be transmitted to other tumor masses. The demonstration by oblique or lateral views of the origin of the tumor from the aorta constitutes the direct evidence on which the diagnosis of aneurysm may be made.

CLINICAL APPLICATION OF THE ROENTGENOLOGICAL EXAMINATION

In the present state of medical knowledge, a roentgen diagnosis of arteriosclerotic or hypertensive aortic change is of no avail as an indication for therapeusis. It does not contribute anything to the treatment of the individual case. Whatever therapeutic value there is in roentgen examination in these diseases is not in the roentgen examination of the aorta, but in that of the heart and in the demonstration by roentgen examination of disturbed visceral or peripheral circulation. The opposite, however, is true of the diagnosis of syphilitic aortic disease. Here, the correct roentgen diagnosis may, and often does, provide clear indications for the correct therapeutic procedures, not only for the aortic disease itself, but for the constitutional condition of which the aortic disease may be the only available diagnostic evidence.

When it is recalled that syphilis is one of the most common and easily one of the most fatal diseases and that aortitis is one of its most frequent manifestations, the importance of any method of examination which will contribute (as does the roentgen method) to aid and increase the accuracy of the diagnosis, should be apparent. The roentgen examination is admitted by many authorities, to be a valuable aid, and many times of diagnostic importance in the diagnosis of aortic syphilis.

It is estimated that the population of the United States is 122,000,000, and that 10% of the population are affected by syphilis, thus giving 12,000,000 as the number affected by syphilis, and that 20 to 30% of those who acquire syphilis develop aortitis, giving, therefore, the approximate number of cases of syphilitic aortitis in the United States as at least 2,000,000 to 3,000,000. The appalling immensity of the problem of this disease is forcefully shown by these statistics, and the necessity of the medical profession's availing itself commonly of such a valuable diagnostic aid as the roentgen examination is clearly evident.

METHODS OF ELECTROCARDIOGRAPHY AND THE NORMAL ELECTROCARDIOGRAM*

BY JAMES M. FAULKNER, M.D.†

THE string galvanometer has now been in clinical use for about twenty-five years. During this period it has added enormously to our knowledge of the physiology of the heart and of the nature of the disturbances underlying many of the disorders of cardiac function. It now occupies an important position as a diagnostic method in heart disease. Modern electrocardiographic apparatus has been made so simple and so inexpensive that many internists have found it a practicable adjunct to their office equipment. I am informed by one of the manufacturers that

*Read at the fourth meeting of the Cardiac Course, New England Heart Association, Boston, February 4, 1931.

†Faulkner—Assistant in Medicine, Harvard Medical School. For record and address of author see "This Week's Issue," page 111.

there are between 1200 and 1300 electrocardiograph installations in this country today. The increasing popularity of this method makes it ever more important that medical men fully understand its limitations as well as the information to be derived from its use. No one can fail to be impressed by the extreme sensitivity of the instrument but it must be emphasized that after all it measures only one of the cardiac functions and a perfectly normal electrocardiogram may be obtained in the presence of obvious advanced organic heart disease.

Time will not permit a detailed discussion of the construction of the modern electrocardiograph. There are at present two types on the market: first, the string galvanometer which has been evolved without fundamental change from Einthoven's early instrument. It is essentially a method of recording graphically very small changes in electrical potential. This is accomplished by leading the current to be recorded to a very fine filament of quartz plated with gold or silver which is placed in a powerful magnetic field (see Fig. 1). A current passing from

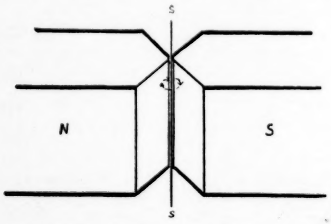

FIG. 1. Galvanometer "string" lying in gap between poles of magnet. (From Pardee.)

above downward through the string will induce a magnetic field about it in a clockwise direction, while a current passing from below upwards will induce a magnetic field in the opposite direction. In the case of a current from above downward the interference of its induced magnetic field with that between the poles of the magnet will be on the side toward the person who is looking at the illustration, for the flow of the field between the poles is from N. to S. The movement of the string in this case will be away from the observer. If the current passes in the other direction through the string, the movement will be toward the observer, because the magnetic field induced about the string is reversed, and the interference is on the opposite side.

The movements of this filament will be greater as the current is stronger, and as the tension of the string is slackened by bringing its two ends closer together. Since the movements of the string are too small to be recorded without magnification, microscope lenses are placed in the magnets on each side of the string, one for bringing a powerful light to focus on the string and the other for magnifying the shadow of the string and projecting it on a photographic recorder.

This is the type of machine in most common use at the present time.

In recent years a new type of galvanometer based on an entirely different principle has been evolved. In this instrument the current from the heart is magnified about three thousand times by means of amplifying tubes similar to those used in radio reception. The recording element is a beam of light reflected from a moving mirror instead of the shadow of a moving string. As compared to the string galvanometer it has certain advantages and certain disadvantages. On the whole it appears to be a satisfactory instrument.

Before taking up the clinical application of the electrocardiograph it will be necessary to review briefly the electrical changes associated with the contraction of skeletal muscle and the application of the same principles to cardiac muscle and the conducting tissues.

In the first place, it has been noted that active muscle is always electrically "negative" as compared to inactive muscle. If therefore we take a strip of uninjured muscle (see Fig. 2) which

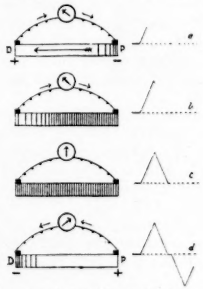

FIG. 2. Action curve of skeletal muscle strip. (From Lewis.)

is connected at its ends with a galvanometer and we stimulate one end of the muscle to activity that end of the muscle will become electrically "negative" in relation to the opposite, inactive end and a current will be set up which will be recorded on the galvanometer. This current is graphically represented on the right by an upstroke. As the excitation wave or wave of "negativity" begins to reach the hitherto inactive end of the muscle the difference of potential becomes less and the galvanometer begins to swing back toward zero, represented graphically by a return toward the base line. When the entire muscle strip reaches a state of activity there is of course no difference in potential between the two ends and the galvanometer registers zero, represented graphically by a return to the isoelectric level. As the wave of excitation passes

off, however, we have a reversal of effects with the distal end of the strip remaining electrically "negative" while the proximal end has returned to its inactive or relatively "positive" state. The result is a swing of the galvanometer in the opposite direction represented graphically by the dip below the base line.

The electrical changes associated with a normal cardiac contraction may be compared to the diphasic muscle curve just described as it might be altered by (1) varying rates of conduction in the various tissues of the heart through which it passes and (2) changes in direction of the excitation wave during its course through the heart.

The normal cardiac contraction arises in the sino-auricular node situated at the base of the right auricle posteriorly. From here the impulse passes radially throughout the auricular muscle until it reaches the auriculoventricular groove where it enters the auriculoventricular or A-V node. From the A-V node the impulse is transmitted by a band of specialized conducting tissue known as the Bundle of His. The Bundle of His extends forward along the upper part of the right ventricular surface of the interventricular septum where it divides, the left bundle branch piercing the septum and both bundle branches coursing down the septum and sending out a wide network of fibers, known as Purkinje fibers just beneath the endocardium. From this diffuse conducting system the impulse spreads outward through the ventricular muscle itself.

The differences in the rates of conduction in the various cardiac tissues account in large measure for the differences between the diphasic muscle curve and a curve taken, for instance, with electrodes placed on the sino-auricular node and apex of the heart. The impulse traveling through the auricle at a rate of 800 to 1000 mm. per sec. produces the gently rounded curve which we call the P-wave. (Fig. 3.) The wave

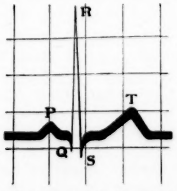

FIG. 3. Typical normal electrocardiogram.

is then held up in the A-V node which has a conduction rate of only 200 mm. per sec. As soon as it reaches the Purkinje system, however, we see it distributed like a flash of lightning to the whole ventricular endocardium at a rate of 4000 mm. per sec. This is expressed on the electrocardiogram by the Q-R-S complex. From the endocardium it passes out through the ventricular muscle at a rate of 400 mm. per sec. With the whole ventricle in contraction the curve reaches an iso-electric level followed by another more gradual deflection, the T-wave, as the contraction passes off. We note a difference here between the heart record and the simple

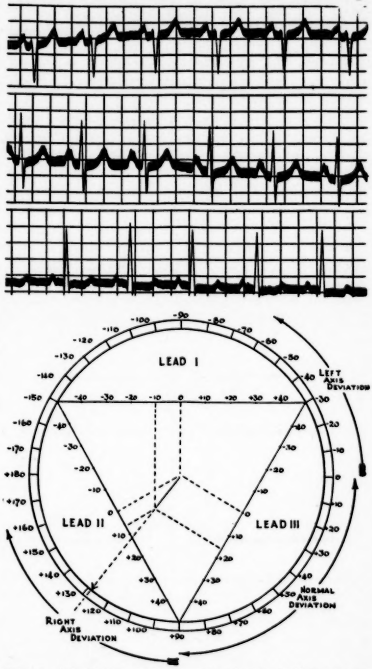

FIG. 4. Illustration of Einthoven's triangle method of determining axis deviation. In this instance there is a high degree of right axis deviation. The patient had marked mitral stenosis. The normal range of the electrical axis is from 0° to +90°. (From White, Paul D., Heart Disease, Macmillan Company, New York, 1931.)

muscle curve in that the final deflection is in the same direction instead of opposite to the initial deflection. This is ascribed to the fact that the preponderant wave of retreat or relaxation does not follow the same order as the wave of excitation but the first part of the ventricular muscle to be activated may remain preponderantly active after other regions of the muscle have become inactive.

It is not necessary to put the electrodes on the heart itself. The tissues of the body outside the heart make perfectly good conductors and if we attach our electrodes anywhere as long as the heart lies between them we will get a record. They may be placed on the two arms, an arm and a leg, on the upper and lower sternum or sternum and back. They have been put down

the esophagus and up the rectum. For routine clinical use the two arms and the left leg are used to apply the electrodes. The advantage of using three electrodes is that we can plot thereby the approximate electrical axis of the heart. In the clinic therefore we routinely take three records, one from the electrodes on the arms, which we call Lead I, one from the right arm to the left leg which we call Lead II, and one from the left arm to the left leg which we call Lead III. It is obvious that the lead which most closely parallels the pathway of the electrical current of the heart will produce the largest excursions of the galvanometer. In normal persons this is often found to be Lead II (Right Arm, Left Leg) which corresponds roughly with the anatomical axis of the heart. On the other hand if the course of the heart current is nearly at right angles to the lead wires we should expect a small deflection of the galvanometer. In normal persons this is found to be frequently the case in Lead III (Left Arm, Left Leg), less often in Lead I.

Methods exist for determining the electrical axis of the heart in exact quantitative terms. Fig. 4 shows Einthoven's method of doing this. The three leads may be represented by the sides of an equilateral triangle. Without going into the trigonometry involved, to determine the electrical axis we have only to measure off from the midpoint of each side of this triangle a distance equal to the amplitude of the excursion (of the Q-R-S wave) in that lead and mark a point. Perpendiculars erected from these points will intersect at one point and a line drawn from the center of the triangle to that point will give us the electrical axis.

Although such measurements give us exact figures of the electrical axis of the heart this is only a very rough approximation of the anatomical axis. The main difficulty is that the electrical axis obtained with the conventional leads is in only one plane so that enlargement of the left ventricle posteriorly, for instance, does not show up on the electrocardiogram. The normal range of axis is also wide. Certain limits of normal have been arbitrarily set by some authorities. I shall not attempt to discuss these here. For practical purposes it may be said that if the main ventricular deflections are upright in all leads the axis is normal, if the main deflection is above the base line in Lead I and below the base line in Lead III there is left axis deviation or left ventricular preponderance and if the main Q-R-S deflection is downward in Lead I and upward in Lead III there is right axis deviation or right ventricular preponderance. Normal persons with high diaphragms may exhibit moderate degrees of left axis deviation, and persons with long narrow chests may exhibit slight degrees of right axis deviation. Left axis deviation may be caused by anything which causes preponderating hypertrophy or dilatation of the left ventricle such as hypertension, aortic regurgitation or stenosis, and mitral regurgitation. Right axis deviation may be caused by anything tending to cause preponderating hypertrophy or dilatation of the right ventricle such as pure mitral stenosis, congenital pulmonary stenosis, and certain cases of diffuse chronic pulmonary disease.

Let us now consider the individual waves of the electrocardiogram and their significance. These waves were arbitrarily designated the P, Q, R, S, and T waves by Einthoven, and these noncommittal designations have been in general use ever since (Fig. 3).

In the study of each deflection we consider not only its shape but also its amplitude, for the electrocardiograph is so standardized before each record is taken that 1 millivolt will cause an excursion of 10 mm. on the record. The amplitude of the deflection therefore is a quantitative expression of the voltage output of the heart at a given instant.

The P-wave is the rounded wave representing the relatively slow passage of the impulse through the auricle. It is normally 1 to 2 mm. in height and is usually highest in Lead II. The P-wave in Lead III is often diphasic. Notching of the P-waves is so common in normal hearts that it cannot be considered an indication of auricular hypertrophy.

The P-R interval normally varies from 0.12 to 0.20 sec., being shorter as a rule in children and with fast heart rates. Vagal stimulation lengthens the P-R interval and sympathetic stimulation shortens it.

The Q-R-S group represents the onset of ventricular contraction. The Q-wave is a small downward deflection which is often absent. The R-wave is an upright deflection, normally present in all leads and highest in Lead II, since according to Einthoven's law the excursion in Lead II is equal to the sum of the excursions in Lead I and in Lead III. The S-wave is the downward deflection directly following the R-wave. Normally it is never as deep as the R-wave is high but in right ventricular preponderance S^{1*} exceeds R^1 and in left ventricular preponderance S^3 exceeds R^3. The total time elapsing between the beginning of Q and the end of S is usually 0.04 to 0.08 sec. and normally does not exceed 0.10 sec. Like the P-R interval the Q-R-S interval is shorter in children and with fast heart rates. Slurring or notching of the Q-R-S complex may occur in Lead III if the excursions are small, and more rarely in Lead I, but notching in two or more leads is not normally found if we except the thickening that is often seen in normal tracings at the very beginning or ending of a Q-R-S complex just as it leaves or returns to the base line.

The maximal excursion of the Q-R-S in any lead is usually 7-16 mm., but normal individuals will occasionally exhibit complexes of lower am-

*S^1 represents the S wave in Lead I, S^3 the S wave in Lead III, etc.

plitude. The individual complexes show slight variation in amplitude dependent on changes of axis associated with the movements of the diaphragm in respiration. In Lead III this phasic respiratory variation in amplitude is often well marked.

The last deflection of the ventricular complex is the T-wave which is normally upright in Leads I and II and may be inverted in Lead III. Its largest excursion is from 2 to 5 mm. in height. The T-wave represents the phase of retreat or relaxation of the contraction. It is increased in height by sympathetic stimulation or exercise.

The interval between the end of the S-wave and the beginning of the T-wave is normally represented by a level line of variable length within 1 mm. of the base line.

The normal heart rate under resting conditions is from 50 to 100 beats per minute, being faster in infants and young children and slower in athletes and sometimes in young adults convalescent from acute infections. It may be as slow as 44 per minute in normal individuals. The rate at any given instant is dependent on the preponderance of vagus or sympathetic activity, the vagus tending to slow the rate and the sympathetic to accelerate it. Variations in vagal tone associated with phases of respiration may thus bring about a phasic variation in heart rate known as sinus arrhythmia in which there is acceleration of the heart during inspiration and slowing during expiration. This is a natural phenomenon in children and young adults.

No two persons will exhibit exactly the same electrocardiogram. Thus the electrocardiogram is almost as unique for the individual as his finger prints. The limits of normal are not yet sharply defined, however. It is a surprising fact that our normal figures are still based largely on a total of only 78 normal students, 52 collected by Lewis and 26 by Pardee. It is well to bear this in mind when great weight is being attached to a minor change in the electrocardiogram. It is also important to remember that a normal electrocardiogram does not rule out serious heart disease.

THE USE OF THE ELECTROCARDIOGRAPH IN THE STUDY OF CARDIAC ARRHYTHMIAS, BRADYCARDIA, AND TACHYCARDIA*

BY E. H. DRAKE, M.D.†

THE electrocardiograph is used in the study of cardiac arrhythmias (1) for the purpose of making a diagnosis in the individual case, (2) in order that further insight may be gained concerning the meaning, causes, and outcome of various irregularities, and also (3) that by the frequent comparison of clinical and electrocardiographic findings we may learn to distinguish the irregularities without the aid of graphic records.

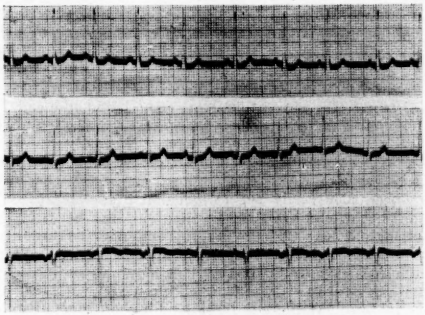

FIGURE 1. Sinus arrhythmia and ventricular escape.

BRADYCARDIA

The point in determining the type of bradycardia lies in discovering the cases of auriculoventricular heart-block. Other forms of slow pulse carry a good prognosis. Bradycardia may result from an abnormally slow pacemaker, may be due to partial heart-block with impulses failing to reach the ventricles, or may be caused by a slower ectopic rhythm, as in the case of a-v nodal rhythm or the idioventricular rhythm of complete dissociation between auricles and ventricles.

ARRHYTHMIA

A slow heart may be irregular; the two common innocent irregularities of the heart occur without a rapid pulse: they are sinus arrhythmia and premature beats. In the case of sinus arrhythmia there is a waxing and waning of the heart rate, depending in the youthful type upon

*Read at the fourth meeting of the Cardiac Course, New England Heart Association, Boston, February 4, 1931.

†Drake—Attending Physician, Maine General Hospital. For record and address of author see "This Week's Issue," page 111.

the phases of respiration (Fig. 1). The impulse arises always at the s-a node as is seen by the presence of a normal P wave preceding each QRS. As an exception to this rule the ventricle may escape from the control of the slow rate and beat one or more times from impulses arising in the a-v node.

Premature beats (extrasystoles) may arise either in the auricles or in the ventricles. Their significance comes from the fact that they are common and may be mistaken for serious irregularities. In the case of auricular premature beats

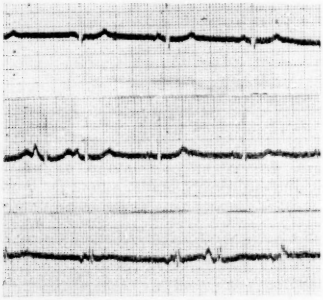

FIGURE 2. Auricular premature beats.

(Fig. 2) the P to P interval is shortened and the P wave is discovered to be of abnormal form, showing that its origin is outside the sinoauricular node. When the P wave is sufficiently premature it will fall with the preceding T wave, the form of which is consequently altered. The QRS following an auricular premature beat may be of altered character, the extent of the deformity being proportional to the degree of prematurity of the P wave.

A ventricular premature beat ordinarily precedes the P wave, the QRS is widespread and is followed by an exaggerated T wave (Fig. 3). A longer diastolic pause follows premature beats; if the extrasystole arises in the ventricle, this pause is exactly compensatory so that the interval including the premature beat is just equal to the time occupied by two normal beats. Ventricular premature beats may be so little premature that P waves are seen and the regularity of the pulse is little disturbed or they may arise in the neighborhood of the auriculoventricular node and be followed by P waves by means of retrograde conduction. A condition known as digitalis bigeminy consists in coupled rhythm with a normal beat followed by a premature beat and its compensatory pause, the heart continuing to beat in couples.

In determining the nature of pulse intermissions, the serious cause to be ruled out is a dropped beat from heart-block. This is more quickly and easily determined in doubtful cases by electrocardiography than by any other method of study. Auriculoventricular heart-block, in its earliest stage, shows only a long conduction time from auricle to ventricle, a defect which can be told only by a graphic record. The next step in severity is the dropped beat phenomenon, with an occasional P wave not followed by a QRS. When this occurs at regular intervals so that only every second or third P wave is followed, it is designated 2:1 or 3:1 partial block (Fig. 4). The final stage, complete block (Fig. 5), consists in entire failure of auriculoventricular conduction so that an idioventricular pacemaker in the ventricle is forced to take up the burden of originating impulses. The ventricular rate is slow (20 to 40 per minute) and the auricular waves show no time relation to the QRS waves.

Arrhythmia found with fast heart rates will be discussed under the next heading—tachycardia.

TACHYCARDIA

Tachycardia may be due to a simple rapidity of the heart, the rate being 100 to 150 per minute with fluctuations in speed and a gradual return to normal rate. The electrocardiogram

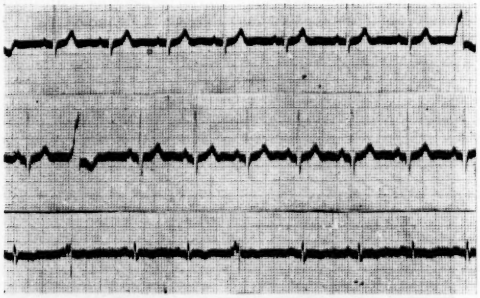

FIGURE 3. Ventricular premature beats.

shows a normal form of the P waves. Auricular paroxysmal tachycardia (Fig. 6) has a more rapid rate, 150 to 200 per minute, the P waves

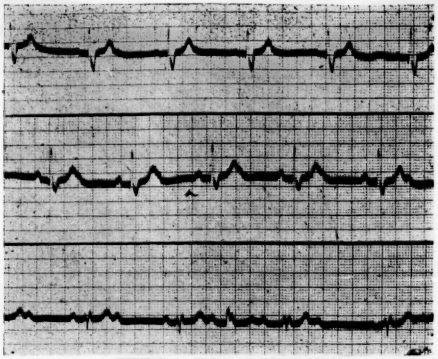

FIGURE 4. 2:1 partial heart block.

are of unusual form for the individual, the onset and offset of the paroxysms are abrupt, and the attack may often be terminated by some form of vagal stimulation. Either auricular fibrillation or flutter may occur as a paroxysm of tachycardia or as an established condition. In auricular fibrillation the ventricular rate is usually 120 to 160 per minute in untreated cases, the electrocardiogram shows no P waves, and after slowing with digitalis a record of the fibrillating wave can often be seen as an undulation of the base line (Fig. 7). Auricular flutter

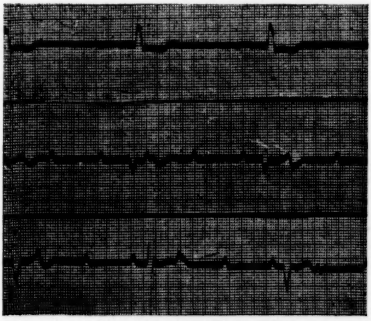

FIGURE 5. Complete heart block.

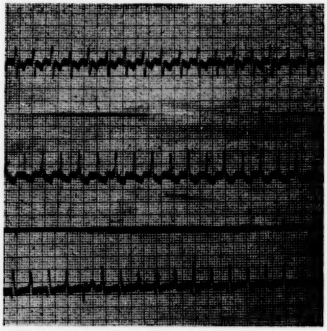

FIGURE 6. Auricular paroxysmal tachycardia with alternation of QRS.

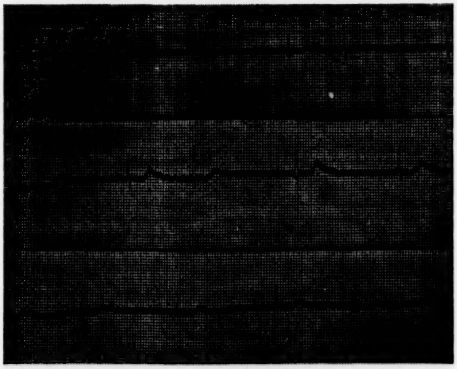

FIGURE 7. Auricular fibrillation.

is often seen with a regular pulse of 120 to 160 per minute and with little variation in speed on rest or exercise. This means that 2:1 heart-block is present and that the auricular rate is twice that of the pulse. Flutter may also present an irregular tachycardia indistinguishable from fibrillation except by a tracing (Fig. 8). Auricular flutter may be changed to fibrillation by the use of digitalis; if the administration of digitalis is then discontinued the heart may spontaneously return to normal rhythm. Tachycardia may arise from the ventricle; the rate is 150 to 200 per minute and the pulse is nearly regular. Such an abnormal rhythm may well be confused with auricular paroxysmal tachycardia but the electrocardiogram on study discloses the abnormal shape of the ventricular complexes which in appearance resemble ventricular premature beats; if the P waves can be identified, it will be seen that they bear no time relation to the QRS waves (Fig. 9).

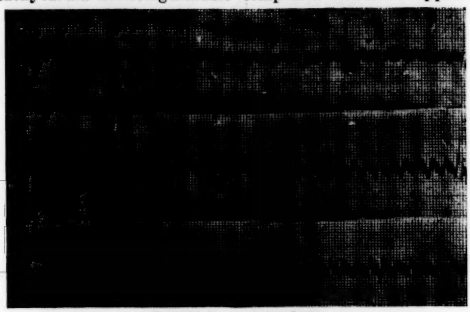

FIGURE 8. Auricular flutter.

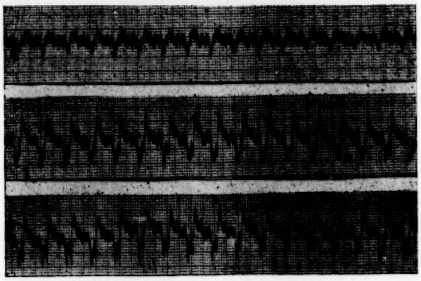

FIGURE 9. Ventricular tachycardia.

Thus electrocardiography quickly distinguishes between the various mechanisms responsible for rapid heart action and thereby often establishes the best course of treatment to pursue.

THE CLINICAL SIGNIFICANCE OF ABNORMALITIES OF THE ELECTROCARDIOGRAPHIC COMPLEXES (ABSTRACT)*

BY L. M. HURXTHAL, M.D.†

ABNORMALITIES of the electrocardiographic complexes may result from a wide variety of clinical conditions. The most important of these are as follows:

(1) Acute febrile diseases: diphtheria, acute rheumatic fever, acute pericarditis.
(2) Drug action: digitalis in particular.
(3) Glands of internal secretion — thyroid: exophthalmic goitre, myxedema.
(4) Chronic infectious disease involving the heart, pericardium, and vessels: syphilis, tuberculosis, rheumatic disease.
(5) Degenerative and malignant disease: arteriosclerosis, uraemia, cardiac metastases.
(6) Congenital heart disease.
(7) Localized injury to the heart: stab or bullet wounds.
(8) Mechanical displacement of the heart, as by pneumothorax and collapse of the lung.
(9) Functional—etiology unknown.

*Read at the fourth meeting of the Cardiac Course, New England Heart Association, Boston, February 4, 1931.
From the Medical Department, Lahey Clinic, Boston, Mass.

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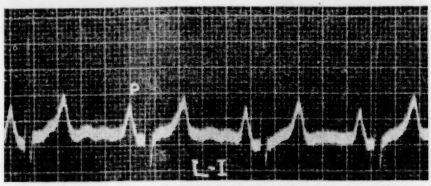

FIGURE 1. Unusually high P wave from a case of mitral stenosis (Lead I).

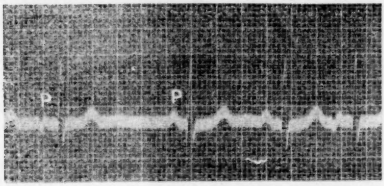

FIGURE 2. Inverted P waves occurring with auricular premature beat, the origin being outside the normal pacemaker.

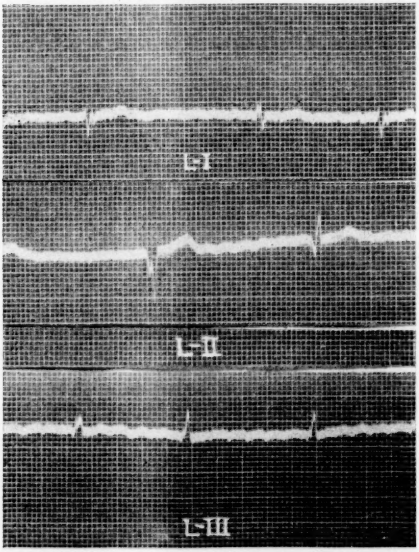

FIGURE 3. Low complexes from a case of arteriosclerotic heart disease, with auricular fibrillation and congestive heart failure.

The manner in which these conditions alter the electrocardiographic complexes naturally varies considerably but in the final analysis they must affect one or more of three physiological properties of heart muscle, namely—excitation, conduction, and contractility.

I—ABNORMALITIES OF THE P WAVE

The chief variations of this part of the electrocardiogram are:

(1)—Unusually high *P* waves (Fig. 1)
(2)—Notched *P* waves (Fig. 5)
(3)—Inverted *P* waves (Fig. 2)
(4)—Abnormally placed *P* waves

(1 and 2) High *P* waves and notched *P* waves are of no clinical importance except that they are frequently found in mitral stenosis.

(3) An inverted *P* wave usually indicates an auricular contraction which has been induced

by a stimulus arising outside its normal exciting center, the sinoauricular node. This abnormal stimulus may arise anywhere in the auricle, the bundle of His, auriculoventricular node or even in the ventricle. When arising in the ventricle, the stimulus must naturally pass backward over its usual course and is thus termed retrograde. The inverted *P* wave may be isolated (premature beat or extrasystole) or rapidly repeated (paroxysmal tachycardia).

(4) An upright *P* wave of normal shape which appears at first glance to be abnormally placed is in reality in its normal position and the remainder of the electrocardiographic complex is absent or delayed.

II—ABNORMALITIES OF THE QRS COMPLEX

Abnormalities in this phase of the electrocardiographic complexes are of more importance clinically than changes in the *P* wave. In many instances they are associated with lesions which have grave prognostic significance.

(1) Low QRS Complexes (Fig. 3) should always be viewed with suspicion. Hearts with little reserve may display this abnormality particularly where there has been widespread degenerative change. Myxedema probably causes the greatest reduction of amplitude of these waves.

(2) Heart Block can be defined as delayed or blocked transmission of the excitation wave through the conducting mechanism. The origin of the impulse in the normal pacemaker or sinoauricular node may fail to take place, or, having arisen, the auricle may not respond to it. This is known as sinoauricular block. If the excitation wave has reached the auriculoventricular node (or bundle) its passage through these depends on their ability of transmission. The auriculoventricular node (or bundle) may receive the stimulus in four different states:

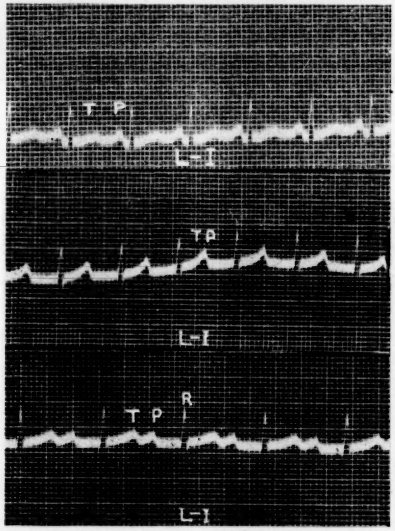

FIGURE 4. Three tracings of Lead 1 from a case of rheumatic heart disease before, during and after an attack of acute rheumatic fever. In the first tracing there is a normal P-R interval, and the P wave is higher than the T wave. In the second tracing the P-R interval has been prolonged, so that the P wave and T wave coincide. In the third tracing the P-R interval is less than in the former tracings, and the P wave and T wave are now separated.

(a) The impulse may be transmitted normally, but the ventricle may or may not respond, depending on its state of excitability.

(b) There may be a delay of conduction either temporarily or permanently, producing a long P-R interval (Fig. 4).

(c) There may be a complete obstruction of the transmission of the impulse at intervals or permanently, thus producing various degrees of heart-block such as 4:1, 3:1, 2:1 or complete heart-block and complete dissociation between the auricles and ventricles (Fig. 5).

(d) There may be blocking of an impulse from the auricle, but not in the reverse direction backward from the ventricle or vice-versa.

Heart-block is frequently associated with the severer types of heart disease. It may be found

transiently or permanently in acute rheumatic fever and diphtheria. It may be produced by digitalis. The effect of atropine in these digitalis cases is striking. Occasionally no etiological factor can be discovered. If it is not of high grade, it is not necessarily serious and even complete heart-block may permit life for years without symptoms. When the ventricular rate is markedly slowed, however, serious consequences may ensue, either by reason of the slow rate producing syncope or because of a weakened heart muscle which is a complication of the retarded rate.

(3) Changes in Axis Deviation have been dis-

FIGURE 5. Lead 1 from a tracing of a patient with high-grade heart-block produced by digitalis. The characteristic inversion of S-T interval and T wave is to be noted. The first P wave in the tracing is followed after a prolonged interval by a Q R S complex. The second P wave which falls on the second T wave in the tracing, is not followed by a ventricular contraction. The same is true of the fourth P wave in this tracing. Notched P waves are to be noted.

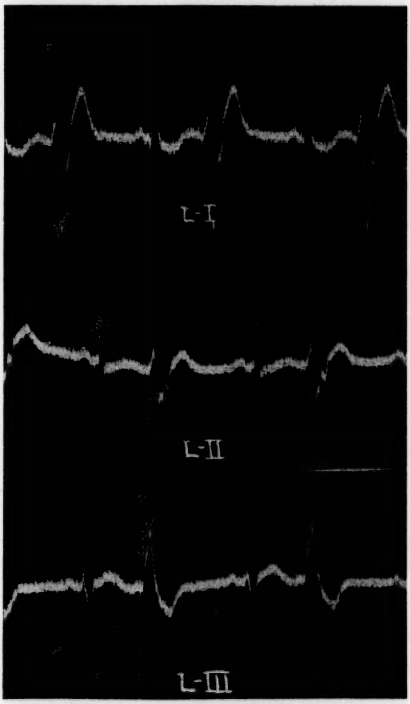

FIGURE 6. Tracing from a patient with ventricular extrasystoles occurring between each heart beat. The origin of these extrasystoles is in the left ventricle. Note the change in axis deviation from the normal ventricular complexes which show left axis deviation.

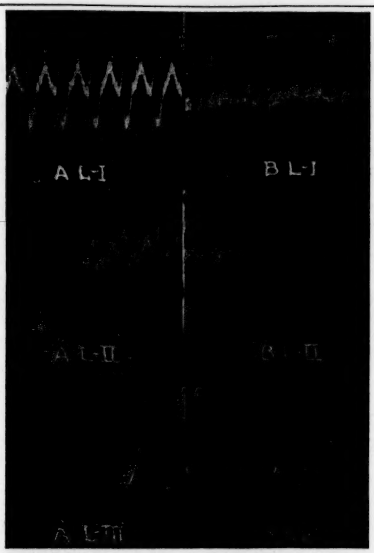

FIGURE 7. Two tracings from a case of paroxysmal ventricular tachycardia. The first set are those taken during the paroxysm, showing right axis deviation due to paroxysmal ventricular tachycardia arising in the left ventricle. The second set of tracings are those taken after the paroxysm had stopped, showing the normal complexes and slight left axis deviation.

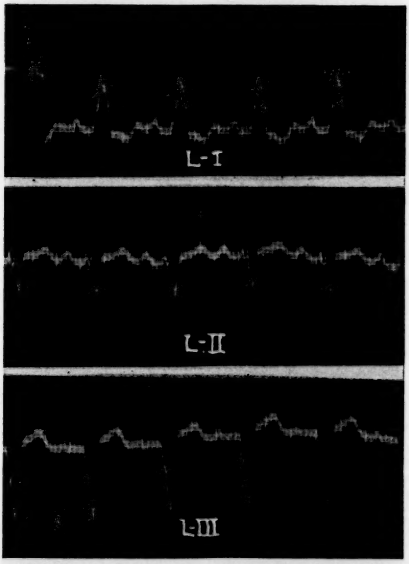

FIGURE 8. Tracing from patient with arteriosclerotic heart disease and coronary sclerosis, showing intraventricular block with left axis deviation.

cussed and will not be gone into again except to point out the association with ventricular premature beats (Fig. 6), ventricular paroxysmal tachycardia (Fig. 7) and block of the bundle branches (Fig. 8). The abnormal *Q-R-S* waves are similar in shape in these three conditions. In many instances interference with transmission of the impulse as it proceeds from the auriculoventricular node down the main stems is caused by destructive lesions, in other instances there appears to be some functional change which renders defective transmission along one or the other of the main bundle branches. Such impaired conduction causes marked changes in the *Q-R-S* phase. It has long been held that block of the right bundle produced an electrocardiographic complex approaching a true levogram or clinically left ventricular preponderance, while block of the left bundle branch produced the dextrogram. Recent work by Wilson et al. and earlier observations by Oppenheimer et al. would seem to show that this conception is false and that the reverse is true. Whatever proves to be the truth, there seems to be little doubt that one or the other bundle is involved. Clinically, such electrocardiograms showing bundle branch block are usually associated with degenerative lesions of grave type. Sooner or later the majority will have trouble.

III—VARIATIONS IN THE T WAVES

The *T* wave or end deflexion is closely associated with the physiology of the ventricular muscle. In the normal electrocardiogram it is upright in Leads I and II. It may normally be upright, flat, or slightly inverted in Lead III.

Various experiments and clinical conditions help us to picture the significance of the *T* wave. In the first place, we know that exercise increases the height of the *T* wave. Clinically, we frequently see exaggeration of the T waves in patients with exophthalmic goitre who have otherwise normal hearts. Myxedema, on the other hand, depresses the *T* waves and all the complexes at times and can readily be returned to normal by thyroid feeding (Fig. 9). Experimentally, it has been shown that drinking ice water may depress the *T* waves in healthy subjects. Application of cold to the heart of the experimental animal, likewise, causes T wave depression or inversion, while the application of heat exaggerates them. Digitalis causes a depression and even inversion of the *T* wave and *S-T* interval which is so characteristic that electrocardiography is sometimes a very useful method of following digitalis therapy (Fig. 5). Ligation of the coronary arteries in animals is first followed by *T* wave exaggeration and later

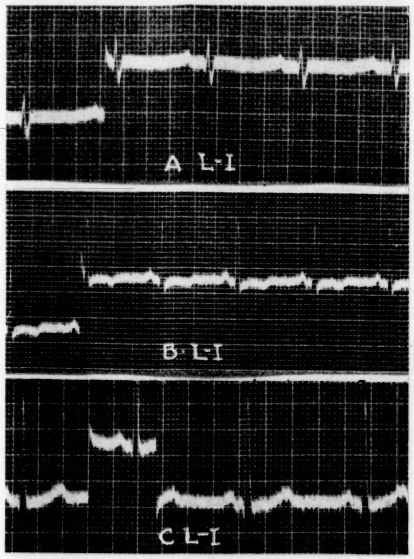

FIGURE 9. Three tracings from a patient with high-grade myxedema and congestive heart failure. First tracing represents Lead I before thyroid therapy. The second tracing shows the result after twelve days of thyroid feeding. The third tracing shows the complexes as found three months later.

by depression. Still later, as the process heals, the waves may return to their normal amplitude and direction. Obstruction or thrombosis of the coronary arteries in man is likewise followed by *T* wave inversion (Figs. 10 and 11). During acute febrile diseases, such as rheumatic fever, pericarditis, and pneumonia significant but usually transient alterations of the *T* waves may take place.

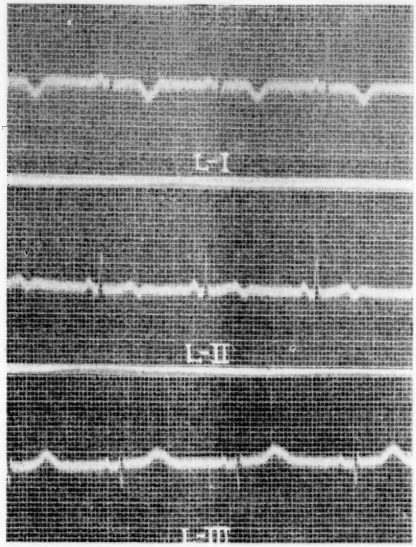

FIGURE 10. Tracing from a patient who had a history of a typical coronary thrombosis several months before, and who suffered from angina pectoris thereafter.

Barnes and Whitten believe that *T* wave inversion may be caused by strain thrown upon one or the other ventricle; hence, the inversion of the *T* waves in Lead I or Leads I and II in hypertension, aortic stenosis, or of the *T* waves in Leads II and III in mitral disease. They find, however, that cardiac infarction is the most frequent cause of *T* wave inversion and suggest, on the basis of post-mortem examination, that infarction of the left coronary artery produces inversion of *T1* or *T1* and *T2* (Fig. 10) and that infarction of the right coronary artery, which supplies the right ventricle and posterior portion of the left ventricle, is followed by inversion of *T2* or *T2* and *T3* (Fig. 11). This is an interesting observation and needs further study.

THE APPEARANCE OF T WAVE CHANGES AND THEIR SIGNIFICANCE IN CORONARY DISEASE

There is evidence to believe that the *T* waves may actually be increased immediately after coronary infarction. Following this, a gradual depression takes place. Pardee and Oppenheimer have called attention to the elevation of the *R-T* segment as being especially significant of coronary infarction. Parkinson and Bedford have proposed a plan illustrating the evolution of the inverted *T* waves from the high *R-T* segment. There is no doubt as to the value of this type of *T* wave change. It is found, however, in probably not more than half of the cases. If the patient recovers, there may remain a permanently inverted *T* wave, or if destruction is not extensive, the defect may entirely disappear within six months to several years.

With the greater use of the electrocardiogram, we are recognizing many atypical clinical cases of coronary infarction. One no longer needs to have classical signs such as marked collapse with drop in blood pressure, severe pain, and almost death to make a diagnosis of coronary infarction. We know from post-mortem examinations that infarctions are found in which there has been no history of such dramatic events. We know it can occur with only mild pain; we know it may simulate acute indigestion and further we know it may appear as the first attack of "angina pectoris".

If negative *T* waves are not found in a suspected case of acute coronary thrombosis, subsequent serial electrocardiograms should be done, for only in this way can records be obtained

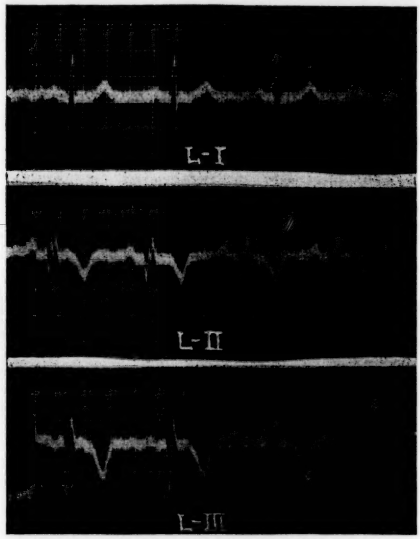

FIGURE 11. Tracing from a man who had a typical coronary thrombosis six months before.

which give us an impression of the changes going on in the heart muscle. If inverted *T* waves are found accidentally in a patient with no other explanation than possible coronary disease, a thorough cardiac study and history is indicated and a guarded prognosis should be considered.

LEAGUE OF NATIONS DEBATES HEROIN

The Austrian proposal to suppress heroin was warmly debated at the League of Nations Conference last month, with the majority of the nations in favor of its abolition. A passage of arms took place between the Swiss delegate, Mr. Dinichert, and the Italian delegate, Signor Cavazzoni, when the latter charged that, although the world's legitimate heroin needs were only 1,600 pounds a year, five times this amount had been made in Switzerland in four months.

The British, Swiss and German delegates having said that the medical profession in their countries were either against or partly against the suppression of heroin, were challenged by the Polish delegate, Dr. Chodzko, a physician, to show when and where these medical organizations had gone on record to this effect.

CLASSES IN SPIRITUAL TEACHING FOR NURSES

Classes in Spiritual Teaching for nurses will be conducted by Mrs. Jane Sagendorph, at 10 Charles River Square, Boston, Mass., beginning September 1, 1931.

The object of this work is to create a closer coöperation on the part of the nurse with the physician's plan for the patient's recovery, that she may obtain the Scientific Spiritual Psychology valuable in the care of the sick and thereby receive for herself the ideal element necessary to a happy and successful career.

The course will include, a study in the power of Suggestion, its value, and particularly its dangers. Simple methods for the relief from fear and from pain through the relaxation of the nervous system; Study of parts of the Scriptures with the purpose of using this knowledge for practical purposes. The teaching will be non-sectarian. Arrangements may be made for classes or for individual instruction at hours to suit the nurse's time.

The increasing demand for "the understanding nurse", especially for those cases where depressed mental conditions accompany the disease, has produced the need for the study of personality from the spiritual standpoint.

Satisfactory students taking this course will be highly recommended to physicians requiring nurses for special cases.

JUNIOR STAFF APPOINTMENTS: AN EDUCATIONAL RESPONSIBILITY

BY STEPHEN RUSHMORE, M.D.*

THE place of the hospital in the scheme of medical education is assured in the sense that it performs a function that is now regarded as indispensable. The limits of the function are not clearly defined and indeed may vary with the character of the hospital and of the medical school. So it is better to speak of the *functions* of the hospital in medical education and even medical education may be so defined as to include the direct and indirect influence on the layman as well as on the student in the professional school. The hospital may be envisaged as a center from which knowledge of health and disease may radiate in every direction, and gradually permeate all groups which come in contact with it. This comprehensive function few hospitals perform, yet however far such activities may lead from the limited objective for which hospitals were often founded, it must be acknowledged that there is a trend in this direction. The nurse was developed in the hospital to do certain work in connection with the care of the patient and the running of the hospital. For this, individuals were trained by the hospital. Gradually the idea is spreading that the training of the nurse is really an educational responsibility, not a purely economic (and economical) device. So the interne was introduced to do certain work for which the visiting physician did not have the time or inclination. There is a growing awareness that the internship carries an educational responsibility for the visiting staff of physicians, and this is formally recognized in the requirements of some medical schools that a year's internship shall precede the granting of the medical degree, and by some state boards of registration that such internship shall precede the granting of the license to practice. This requirement by both medical school and state board of licensure implies an obligation to see that internship fills a definite place in the educational procedure, that is to say, is really educational and complies with certain standards of education. It is manifestly absurd to suppose that mere residence in a hospital for one year, in any way assists in qualifying for pursuing the practice of medicine.

Another department of hospital activity capable of utilization for educational purposes and generally neglected from this point of view, is the junior visiting staff, by whatever name this group of physicians is known. The prime purpose of this group is to do for the hospital certain work in the care of patients that for one reason or another, the senior visiting staff cannot or will not perform. It is because of the widespread neglect of the educational opportunities and obligations which the junior visiting staff involves that attention is called to this matter now.

*Rushmore—For record and address of author see "This Week's Issue," page 111.

The present system may be described as working in a general way in the following manner: a young physician who has recently completed his internship is appointed to the lowest position on the visiting staff for one year (usually in the same hospital). Work is passed down to him ordinarily if someone else higher up does not want to do it. At the end of the year reappointment is made unless evidence of grave unsuitability is apparent. As death or the retirement age makes vacancies in the higher positions, promotion in the lower grades occurs. Often the highest position on the service is reached because of unobtrusive mediocrity, a willingness to stand for anything a senior may perpetrate, complete conformity and certain gifts (or absence of gifts) which keep the individual from dying young. There is no selection because of outstanding ability and promotion therefor, no systematic and orderly effort to place before the junior certain opportunities, to help him take advantage of them, to check up on what use he does make of them, and to reject him if he does not grow, in some degree commensurately with his opportunities. It is the rejection that is the most difficult, occurring usually only because of rank nonconformity or gross breach of the conventionalities (as in cases involving moral turpitude). The result is that one often sees an astonishing exhibition of mediocrity in high places.

Junior staff appointments are capable of being developed into educational opportunities for graduate work of tremendous value, and should be so developed in every center of medical education. It would require time and attention and intelligent effort on the part of the senior staff. It would in time, raise distinctly the level of practice in the community. The difficulty of "rejection" could be met in large part by providing that no member of the junior visiting staff should be reappointed for more than five consecutive years. This would give ample time for a man to demonstrate his capacity. Automatically every member of the junior staff would go off at the end of his fifth year, without the stigma of dismissal. Reappointment after one year, if it occurred, would be as a recognition of merit and distinction, and not because disease or physical death had failed to intervene. In this way deadwood would be eliminated before it reached a position of power. Under no system is there a guarantee that unintelligence will not reach such a position, but if the suggestion made in this note were more widely carried out, such misplacement would become less likely. However, the really significant change would be that a far more efficient system of graduate instruction of great educational value would be extended to many important centers of medical education.

CASE RECORDS
of the
MASSACHUSETTS GENERAL HOSPITAL

ANTE-MORTEM AND POST-MORTEM RECORDS AS USED IN WEEKLY CLINICAL-PATHOLOGIC EXERCISES

EDITED BY RICHARD C. CABOT, M.D.
F. M. PAINTER, A.B., ASSISTANT EDITOR

CASE 17281*

DIPLOPIA AND SLOWNESS OF SPEECH

MEDICAL DEPARTMENT

PRESENTATION OF CASE

DR. SVEN M. GUNDERSEN**: This was a fifty-two year old married American business man who entered the hospital on April 15 complaining of headache. His history was obtained from his second wife, to whom he had been married only fifteen months, so perhaps some of the statements are not reliable.

He had been in fairly good health. For three years before admission he had had some frequency of urination at night and dyspnea and palpitation on exertion, but he had not been inconvenienced in any way and did not consider himself ill. After he remarried fifteen months before admission he was refused life insurance because of a cardiac condition believed to be hypertension. Shortly after that he met severe financial reverses through the crash of the stock market and was forced to take new and very hard work. Six months before admission he thought he noticed some falling off in vision and had occasional attacks of diplopia. He was not very much concerned over those symptoms. Four months before admission he took another kind of work which he did not like. It was very hard work, involving a good deal of running upstairs. He would be exhausted at the end of the day. His wife about that time thought he was slowing up mentally. This was borne out by the fact that he had to take two or three times as long as usual to work out simple problems. She also noticed some slowness in speech. Three months before admission he had more serious eye trouble. There were more attacks of diplopia and his vision was constantly becoming poorer. Two months before admission an optometrist said that his eyes were normal. His wife was certain that there were no marked changes in personality up to this time. She considered his behavior perfectly normal except that perhaps he was a little retarded mentally.

Three weeks before admission while at his office he stooped over to tie his shoe, when he suddenly had a very severe knife-like pain over the left eye. He felt weak, nauseated and confused. He sat still in a chair for five hours. At the end of that time his mind was clear enough so that he was able to get up and go home. He was still nauseated when he arrived. From that time his wife noted certain definite personality changes. Before that he was always very courteous. After that he was abrupt in manner, cruel in his attitude towards her and often rough and boisterous. He complained after that of photophobia. He was very drowsy and listless and at night breathed stertorously. He was able to walk perfectly well. No twitching was noticed by his wife. Seventeen days before admission, four days after his first attack, he had another attack of severe pain over the left eye, much the same as the first. From that time on he became distinctly aphasic. He mumbled and talked incoherently. He was very much concerned over the hard lot of his wife at that time and thought that she was very unfortunate to have to put up with him.

The past history is essentially negative.

General physical examination at admission was negative except for hypertension. There was apparently not much cardiac enlargement. The blood pressure was 230/140. There were certain definite findings on neurological examination. The fundi showed blurred discs, the right more than the left, but neither disc was swollen to a measurable degree. There were marked changes in the retinal vessels, excessive for his age. There were fairly large nerve fiber layer hemorrhages in each retina and deeply placed exudates of the cotton wool type in each. From the fundi alone Dr. Waite favored vascular pathology rather than intracranial tumor. On neurological examination the right facial nerve showed slight weakness. There were slightly increased arm reflexes on the right and perhaps slight sluggishness of the right abdominals. These findings were not very marked, but became more marked as he stayed in the hospital. There was aphasia, difficulty in expression and also difficulty of comprehension. Three days after admission and two days before he died the neurological findings were very definite. There was no Babinski however. The right abdominals were absent and the right arm reflexes were increased over the left. Dr. Kubik thought that the findings were consistent with a left frontal lesion and believed tumor rather more likely than a vascular lesion.

On laboratory examination three urine specimens all showed a specific gravity of 1.014 to 1.016 with a very slight trace to a slight trace of albumin. One specimen showed a few granular and hyalin casts and occasional white cells. All showed red cells, never more than 10. There was no anemia. The white blood cell count on admission was 14,600 and the day before death 16,900. A Hinton test was negative. A stool was negative. The non-protein nitrogen was 47, the blood sugar normal. The renal func-

*This report gives the essentials of two discussions, one in Dr. Cabot's Third Year class, one at a conference of the hospital staff.

**Recently senior interne on the East Medical service.

tion was 20 per cent in two hours, the CO_2 combining power 64.4 volumes per cent.

X-ray examination of the skull showed the sella turcica normal in size and shape. There were two areas of calcification in the region of the pineal gland about half a centimeter apart. These shadows appeared to the right of the midline. There were localized areas of rarefaction in the frontal bone which were probably due to convolutional atrophy. Similar less marked convolutional atrophy was seen in the occipital and parietal bones. The blood vessel markings were not remarkable. The examination was negative except for questionable displacement of the pineal towards the right and evidence of chronic increased intracranial pressure.

A lumbar puncture showed the initial pressure 170, clear xanthochromic fluid, normal dynamics, 10 lymphocytes, one mononuclear, one polynuclear, total protein 52, colloidal gold 0001123210, Wassermann negative.

The course was not remarkable, quite afebrile. The pulse varied between 80 and 90. The respirations were normal.

Dr. Sisco saw the patient on the morning of April 20. He seemed to be getting better. He was then on the bed pan following an enema. After Dr. Sisco left the room he was called back by the patient's wife, who said something had happened to him. He found the patient with his head thrown back on the pillow, his breathing labored, deep and gasping, his pupils contracted, his color excellent, his heart rapid but excellent in quality. There were no convulsions. He took about ten breaths and died, apparently a respiratory death. His heart kept on beating steadily for three minutes after he died.

Clinical Discussion

BY RICHARD C. CABOT, M.D., AND GEORGE W. HOLMES, M.D.

NOTES ON THE HISTORY

Dr. Cabot: No doubt all his troubles four months before admission were put down to "overwork". Nevertheless I believe nobody is made ill by overwork. I think it is a very much overworked explanation of pathologic symptoms. The human will and the human body give out as an oarsman faints at the finish of a race before he does himself any serious harm.

There are two diseases that are especially suggested by that history. I think it is rather a particularly interesting history; there is much real pathos in it. Those two diseases are hypertension with its effects upon the brain and general paralysis of the insane. The second is a good deal less likely than the first, especially if he had hypertension. But it is one of the cases in which no one would be satisfied without making the serological tests for syphilis. My guess at this point is that hypertension with its results will explain everything.

NOTES ON THE PHYSICAL EXAMINATION

There was sensory as well as motor aphasia, the most definite neurological symptom that we have.

The fact that there was no choking of the discs is important. It is the chief point so far against brain tumor, which of course we shall have to consider in our line-up for a final diagnosis.

Hemorrhages, old and new, in the retina are what I was looking for; they must have been there before. That is what we ordinarily get in hypertension.

It is important as we go on to see whether the specific gravity continues to show as little range as at first, but as he had only three urine examinations, that small range of 1.014 to 1.016 is not so important as it might otherwise have been.

I should call that blood normal.

The negative Hinton test is important in relation to the possibilities previously suggested.

Dr. Holmes: The only point of interest in the films is the shadows which we see here. They occur on all the films taken and were apparently interpreted as being the misplaced pineal gland. The two shadows are some little distance apart. I doubt very much if they are the pineal gland. I think it is more likely that they are the choroid plexus. There are two blood vessels coming around in that region that sometimes calcify. I think these shadows look a little more like that than they do like the pineal gland. Sometimes in the anteroposterior view the shadows of those vessels appear at about that area. The question of increased intracranial pressure is also doubtful. I should not put much dependence upon any of these findings.

Dr. Cabot: Could you get those from hypertension alone?

Dr. Holmes: I think not.

Dr. Cabot: You do not prediet therefore that Dr. Mallory will find atrophy of the convolutions? I am rather puzzled by those phrases. They surely do not mean atrophy of the convolutions of the brain?

Dr. Holmes: No. Those changes are due to pressure from the convolutions against the skull.

Dr. Cabot: I see. The atrophy is in the skull, not in the convolutions.

Dr. Holmes: In some cases of hydrocephalus they are very pronounced. It is an x-ray expression.

Dr. Cabot: From what we have just heard I gather that Dr. Holmes is not in favor of brain tumor. I am glad he is not. Certainly the total trend of the case so far is against it.

I wish we had a spinal fluid expert here. That lumbar puncture does not on the whole say anything to me except for the yellow color. That is the manifestation we should have of hemor-

rhage. Those twelve cells bother me a little. They are just a little too much—not very much too much. I do not believe they mean any meningitis. I am going to call them normal. The main thing it seems to me is that they tend to rule out general paralysis of the insane. We need not consider that any further. The whole question now is between hypertension and its results on the one hand and brain tumor on the other.

DIFFERENTIAL DIAGNOSIS

This occurrence of death during or just after defecation is a classical incident. It has happened again and again in hospitals and in private practice. No one is to blame, though people have often been blamed. Nurses and physicians are blamed for allowing a patient to attempt to defecate in this way. All we can say is that defecation is one of the things that definitely bring about marked changes in the blood pressure. But there is no avoiding the danger of the event that happened here. This termination strengthens my belief in the diagnosis we have had in mind all along, hypertension with its effects upon the brain.

The more I check up with pathologists the more I have given up the attempt to say whether or not there is nephritis in these hypertension cases. A pathologist always can find hypertensive changes in the kidneys, and whether he says that there was "nephritis" or not depends on how he is feeling that day. I am going to say this is the kidney of hypertension. They always find the "kidney of hypertension" if chronic hypertension was present. I do not believe myself that there was serious functional kidney difficulty. That is the essential thing in the question whether there is chronic nephritis or not. I think the kidneys did essentially the whole of their ordinary work. I do not believe he died of kidney disturbance. I do not believe he died of heart trouble. I think he probably has hypertrophy of the heart, though the clinical evidence does not show it. One does not often find hypertension going on as long as this has gone on without cardiac hypertrophy. He died of cerebral hemorrhage I think, the effect of hypertension on the brain. I think he had other hemorrhages before that final one, I suppose somewhere in the neighborhood of the speech center, where they could perfectly well cause no other extensive paralysis. But very frequent and disastrous failures in the attempt to localize cerebral lesions on evidence of this kind have made me very gun-shy of any such diagnosis. I have no doubt that he had a cerebral hemorrhage, but where it was I think it is not safe to say. One might say somewhere near Broca's convolution. But I think the chances are that it will not be. Of course it might be somewhere in the radiations back, below or beyond that. That is more probable. Cerebral hemorrhage was the essential cause of death and the essential cause of all his symptoms; back of that hypertension, back of that the unknown causes of hypertension. I do not believe he has a cerebral tumor. I do not believe he died of uremia. And I do not see what else there is to be considered.

A STUDENT: Does hypertension or increased intracranial pressure give choked discs?

DR. CABOT: Yes, but not of the degree or frequency that brain tumor does. Cases have been operated upon for brain tumor largely on such findings as this with edema of the nerve heads. The absence of it here is not against hypertension. It is only strongly against brain tumor. That almost always does cause edema when the patient gets so near death as this.

A STUDENT: In the first examination they reported choked disc of one eye and not of the other. Wasn't it probably present in both eyes?

DR. CABOT: It seems only reasonable to suppose it could be present in one alone.

CLINICAL DIAGNOSES (FROM HOSPITAL RECORD)

Chronic nephritis.
Hypertension.
Cardiac hypertrophy.
Possibly brain tumor, left frontal lobe.

DR. RICHARD C. CABOT'S DIAGNOSES

Primary hypertension.
Cerebral hemorrhages, old and recent.
Hypertension of the heart.
Kidneys of hypertension.

ANATOMIC DIAGNOSES

Vascular syphilis.
Aneurysms of the aorta.
Aneurysm of a cerebral artery, left temporal region, with rupture and hemorrhage.
Vascular nephritis.

PATHOLOGIC DISCUSSION

DR. TRACY B. MALLORY: I am sorry that I selected the day of the Neurological meetings to present this case, because I wish Dr. Kubik could discuss this.

DR. JAMES H. MEANS: Do you know why Dr. Kubik made a diagnosis of tumor? It seems to me the picture would fit well with the gradual onset of hypertensive disease with diffuse arterial lesions and a final vascular episode. On the doctrine of chances he did not have tumor, because that would not explain the whole picture, and it is better not to make two diagnoses if one will cover the whole case.

DR. MALLORY: Dr. Kubik's feeling on the case was that the gradual onset of the symptoms and their duration were a little too long for the average vascular case. On the other hand it was short and abrupt for tumor. It was about halfway between the two in his estima-

tion. He did not feel that the evidence of increased intracranial pressure then could be perhaps explained by a vascular lesion alone.

I think the autopsy findings bear him out to some extent. They show a lesion which would explain just why the course was in between the two. The patient did not have a brain tumor and he did not have a simple cerebral hemorrhage. He had an aneurysm of one of the cerebral arteries. The tumor-like symptoms of the early period of his illness are therefore explained. It was on the left side in the temporal region, about where one would expect from his aphasia. Later the aneurysm ruptured and produced the final cerebral hemorrhage. He also had three separate aneurysms in the aorta. I think Dr. Holmes would have made the diagnosis for us if he had ever had a chest film. The aortic lesions seemed definitely luetic in type, though there was also a great deal of atheroma and considerable calcification of the portions between the aneurysms.

He had slightly contracted and granular kidneys which would go very well with hypertension.

The heart was considerably hypertrophied, as Dr. Cabot suspected it would be, weighing 650 grams.

There was cholesterosis of the gall bladder. That seems to be all.

DR. CABOT: Was there more than one cerebral hemorrhage?

DR. MALLORY: We found only one.

DR. ALLEN G. BRAILEY: He had a number of studies done for lues. His personality changes were certainly suggestive. Several Wassermanns taken outside were negative. The only other evidence that he had ill health was that he did not get life insurance. Eight months before admission he leaned over to pick up something on the floor and had a terrible pain in the back of his head which lasted for several hours. Again he had the same pain when tying his shoe about a month before he came in.

DR. MALLORY: The microscopic examination of the aorta is interesting. On the inner surface there is a laminated blood clot of the type usually found in aneurysmal sacs. Beneath it the intima is thickened and the adventitia also shows marked fibrous thickening. The media however has been completely destroyed over large areas. Where the media persists there is a marked tendency for the intima to split away from it so that small dissecting aneurysms are formed. Dissecting aneurysms are ordinarily atheromatous in origin, not luetic. On the other hand the large saccular pockets which we saw in gross I have never seen except in luetic cases. As confirmatory evidence of lues there are typical perivascular collections of lymphocytes out in the adventitia, one of the things we usually associate with luetic aortitis. I think it is quite possible that there are other etiologic agents which can produce the same or very nearly the same process as far as these microscopic findings are concerned. So far as I know they never produce a gross aneurysm except of the mycotic type seen in bacterial endocarditis and readily excluded in this case. Sometimes those reach a very considerable size.

This section is from the brain. It comes from just the edge of the aneurysm. You can see that this vessel is practically occluded by rather loose fibrous tissue with much atheromatous deposit. The histology here does not particularly suggest lues; it is more like an extraordinary atheromatous process. This is a hemorrhage outside the aneurysmal sac into the surrounding brain tissue.

DR. BRAILEY: What do you think about the cause of these attacks of pain? Might it have been a small hemorrhage each time?

DR. MALLORY: I think that is quite possible. One at least showed very definite organization of the periphery.

DR. HOLMES: You were not able to locate the pineal body?

DR. MALLORY: No. We have not looked for it yet as a matter of fact. It does not look as though it ought to be displaced.

DR. CABOT: I wonder what was the matter with the serology. Rather few aneurysms I have seen have had a negative Wassermann. I certainly should not have thought of aneurysm of the aorta. How large were they?

DR. MALLORY: They were 3 to 4 centimeters in diameter.

DR. CABOT: I suppose the hypertension broke the aneurysm and the aneurysm was due to the syphilis. He had two things here neither one of which alone would have killed him. I do not think the hypertension was due to the syphilis or the syphilis was due to the hypertension. We have to say that there were two independent things which played very good teamwork in killing him.

CASE 17282

A CIRRHOSIS PROBLEM—BILIARY VERSUS LAENNEC'S

MEDICAL DEPARTMENT

PRESENTATION OF CASE

DR. SVEN M. GUNDERSEN*: This patient was an Italian housewife of fifty-four who entered the hospital on March 16 complaining of cough of four months' duration and jaundice of two months' duration.

She had been perfectly well until four months before admission, when she began to have a cough productive of only a small amount of white frothy sputum. Her legs also began to swell. A few days after the cough started she suddenly spat up about half a pint of bright red

*Recently senior interne on the East Medical service.

blood. There was a question whether that was real hematemesis or hemoptysis. We could not be sure. The history is unreliable because of considerable language difficulty. She did not feel very sick during this time. She was carried along by her family physician, who gave some medicine for the cough and required that she rest a few hours a day. She continued to have cough until admission, with however no more vomiting or coughing of blood. Two months before admission her family first noticed that her skin was beginning to get yellow. Nothing was done about that. Her husband happened to have a diagnosis of carcinoma of the tongue and was planning to come in for operation here. Apparently more attention was being paid to the husband than to the wife. The jaundice became progressively deeper until admission. There were some slight changes in the color of the urine and stools to go with that to suggest that there might be some slight obstruction. The stools did not get entirely clay colored however, and the urine did not get very dark. She was not very sick. Two days before admission she had slight vertigo and pain in the left chest and thought she might as well come in before her husband came.

On admission she was seen to be deeply jaundiced. She seemed a little euphoric, squirming about in bed and not apparently understanding what was said to her. Her tongue and mouth were very dry. Her pupils were small and slightly irregular. They reacted poorly to light, better to accommodation. She had definite enlargement of the heart to the left, but also displacement by what was thought to be a high diaphragm, with the apex impulse in the fourth interspace about five centimeters outside the midclavicular line. On both sides the diaphragm was felt to be high, so that we could not be sure just what the size of the heart was. There was a soft apical systolic murmur, not transmitted, thought to be unimportant. In addition there was a harsh rough systolic murmur at the base and we thought there was a definite early blowing diastolic murmur at the left margin of the sternum. The rate was regular. The sounds were of fair quality. There were some râles at the bases, but otherwise the lungs were normal on examination. There were many dilated veins and small venules over the abdomen. There was no caput Medusae. The abdomen was tremendously distended with fluid, showing shifting dullness and fluid wave. The liver edge was felt a handsbreadth below the costal margin, slightly irregular. Some of us thought it was quite firm. It was not particularly tender. There was definite encroachment on Traube's space. There was some enlargement of the spleen, which was easily felt four fingerbreadths below the costal margin on deep inspiration. There was fairly marked pitting edema of both lower legs. The reflexes were normal. There were no hemorrhoids as far as I recall.

She showed on laboratory examination secondary anemia, — 2,200,000 to 2,460,000 reds with 50 to 60 per cent hemoglobin. The white cell count ranged from 11,000 on admission to 13,200 just before she died, twenty-four days after admission. The urine, which was almost clear on entry except for a few pus cells, suddenly developed much pus three days after admission. It was loaded with white cells and on one occasion with reds. There was never much albumin and never any impairment of ability to concentrate urine. Many other laboratory examinations were made. The liver function showed 70 per cent retention of the dye in thirty minutes. The van den Bergh was 13.6 milligrams with direct reaction at admission. It dropped to 11.5 milligrams at another determination and to 9.3 milligrams shortly before death. A lumbar puncture was entirely negative. The findings on the fluid removed from the abdomen were consistent with a transudate. She had a normal electrocardiogram. Otherwise the studies were negative.

A heart film showed a tortuous aorta, apparent enlargement of the heart to the left, and lung changes consistent with passive congestion.

A PHYSICIAN: What was the blood pressure?

DR. GUNDERSEN: It was 150/72.

She did not do well. She was rather euphoric and did not understand what we were trying to do. Her appetite was not good. She ran a markedly febrile course. The first six days showed not so much, but then she started to go downhill. She became less responsive and six days after admission became incontinent of urine. We felt that it was quite clearly cirrhosis, but of what type we did not know. On the chance that it might be luetic, although there was no positive blood and no positive spinal fluid, we gave her potassium iodide in gradually increasing doses. Six days after admission she had become incontinent, though her jaundice seemed to be improving. Eight days after admission there was definite evidence that the ascites, which had been relieved by the preliminary abdominal tap, was reaccumulating. She was put on the danger list twelve days after admission. Dr. Jones saw her and thought the prognosis was grave. He advised intravenous glucose therapy in small amounts with 25 per cent solution, and digitalization in addition to giving her salyrgan in an attempt to reduce the ascites. It was never very effective however, though from the time when she became incontinent we did not know what happened as to diuresis. The first six or eight days we tried it, it did not do any good. Three days before she died she became delirious and was not able to take anything by mouth. She became more and more distended. Part of that distention was certainly due to gas. Even when she could

hardly respond we still continued the intravenous glucose, about 400 cubic centimeters a day. She went downhill and gradually faded out of the picture. Her temperature went up to 104° by rectum before she died.

Clinical Discussion

Dr. William B. Breed: I remember her quite well. I think the difficulty in her case was the absence of a good history, because we do not know anything about her digestive functions prior to the onset of the jaundice. I felt that probably the blood which came from her mouth was from the gastro-intestinal tract rather than from the lungs and that it was part of the syndrome of cirrhosis.

As to the question whether she had heart disease, I rather felt that she did not have any heart disease that we could demonstrate. The diastolic murmur that was heard at the left of the sternum was transient, and I thought that the enlargement of the heart was more apparent than real, because of the high diaphragm and the shifting of position of the diaphragm. She died, I believe, of cholemia. Whether there was pus in the urine I do not know. She was not catheterized.

Clinical Diagnosis (from hospital record)

Biliary cirrhosis.

Anatomic Diagnoses

Cirrhosis of the liver, apparently alcoholic in type.
Pyelitis.

Pathologic Discussion

Dr. Tracy B. Mallory: The autopsy showed of course cirrhosis of the liver. It was distinctly enlarged, weighing just 2000 grams, and was deeply bile-stained. We did not find much else of significance in the body. The heart was a little smaller than normal. The spleen was enlarged, as it might be in any cirrhosis. The lungs were negative. There was a little pyelitis. That was all.

The interesting point in the case of course is what type of cirrhosis it turned out to be. The fact that the liver was large and that she had had jaundice and fever, — that is all in favor of biliary cirrhosis. On the other hand it would be impossible in gross to exclude its being a cirrhosis of the alcoholic type. Interestingly enough that seems to be what the sections show. There was no suggestion of a biliary cirrhosis at all and there was well marked hyalin degeneration of the liver cells perfectly typical of the alcoholic type. Her history of alcoholic consumption was very slight, an average of three glasses of wine a day, and it is unusual to get this type of cirrhosis associated only with drinking wine. Almost invariably there is a history of distilled liquors. Histories of alcohol consumption are often hard to obtain in women, and she may have had more than wine. There is also the possibility, I suppose, that some drug was responsible.

We did find varices in the esophagus. We were not able to find any rupture, but of course her hemoptysis occurred a number of weeks before death, so that is quite consistent.

Dr. Chester M. Jones: Isn't this rather an unusual picture for the so-called alcoholic type of cirrhosis? Clinically it was certainly rather unusual. Your histology of course gives you the picture of degenerative changes in the liver that establishes the diagnosis, and yet the infiltration is very much more diffuse than in the average case of the alcoholic type of cirrhosis, is it not?

Dr. Mallory: Yes. The process seems to be extending much more rapidly than one ordinarily sees it at the time of autopsy.

Dr. Jones: I wonder if there is any possibility at all of there being an infectious process on top of the alcoholic process. There is another patient in the ward who has a clinical picture exactly like this. She is a girl fourteen years old. She has ascites which she has now had for a year and a half; fully developed ascites which disappeared and now has returned. She is acting now as if there were a great deal of portal involvement. At the same time she has jaundice which has persisted throughout the entire period. There is rather a small liver. If you saw the case today in an older person you would say it was rather characteristic of the terminal stage of cirrhosis. I wonder if we do not see infectious cirrhosis more often than we ordinarily think.

Dr. Mallory: I think that is quite possible. If the liver is damaged once it is liable to be damaged again in another way.

Dr. Breed: What did the patient die of?

Dr. Mallory: I cannot say, unless as you guessed she died of cholemia.

A Physician: Were there any changes in the renal tubules?

Dr. Mallory: The autopsy was done so long postmortem that I should not wish to commit myself with regard to changes in the tubules. Extreme degeneration was found, but it might perfectly well all have been postmortem.

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SOCIAL HYGIENE IN PHILADELPHIA

FROM November 1928 to June, 1929, the city of Philadelphia was subjected to a Hospital and Health survey. This investigation, which was under the direction of Dr. Haven Emerson, included among its objectives a study of Public Health Services, of organized care of the sick, and of various special subjects, such as tuberculosis, maternity and child hygiene, conservation of vision, crippled children and cancer. Among the special studies, one was devoted to the subject of Social Hygiene.

Social Hygiene, in America, is understood to mean the prevention and control of syphilis and gonorrhea, and the development of good habits of sex hygiene. The problems that were studied in Philadelphia are probably duplicated in all the larger cities of this country. There may be local differences in certain aspects of the subject, but the essentials are the same. It may be of interest to readers of the *Journal* to review briefly the results of the Survey as applied to this particular field.

The studies undertaken included:

(a) A study of the incidence of syphilis and gonococcus infections.

(b) Studies of the diagnostic and treatment facilities, public and private, together with a review of the laws and ordinances dealing with the control of venereal diseases.

(c) A study of the activities of unlicensed practitioners and of druggists' activities in attempting to diagnose and prescribe for these diseases.

(d) Studies of the more important legal, educational, protective and public informational measures, utilized in the social hygiene program of Philadelphia.

As regards the incidence of venereal disease in Philadelphia, the Director of the Survey says, "No one knows the extent of venereal disease in Philadelphia and those who know most, the physicians, fail largely in their legal obligations to report their diagnoses of these diseases. There was no great difficulty in discovering at least 9.11 patients under treatment for syphilis and gonorrhea on a particular day per 1,000 population, or 18,809 and learning that about as many more are in the hands of druggists and unlicensed healers and quacks of various brands, while only 2,885 cases of these diseases were reported to the Health Bureau of the city in the year 1928."

Abundant facilities were found for hospital and dispensary treatment of syphilis and gonorrhea. The distribution of venereal disease clinics, however, was found not to be logical or in proportion to the need or geographically convenient for the patients most needing care. The follow-up of infected individuals and the tracing of their contacts were not well carried out in most of the clinics.

As was pointed out by the director, fully as many cases of venereal infection are treated by quacks and by drugstores as by licensed physicians. Quacks and commercial frauds under the guise of "Medical institutes" abound and flourish in Philadelphia without interference from Police or Health Departments of State or City.

Among physicians, a large majority (67.8%) had no cases of gonorrhea or syphilis under treatment or observation when questioned during the one-day census. 25.6% had from 1 to 9 cases, 4.2% had from 10 to 24; 1.6% had 25 to 49; and 0.8% had 50 or more cases.

From the point of view of prevention, important efforts are being made to educate laymen as to the value of social hygiene, and some good teaching of children is carried on in the high schools. These efforts lack leadership and a central direction. Prostitution was found to be well handled by the police, although the Courts frequently failed to deal adequately with of-

fenders. Greater attention could be paid to overseeing recreational resorts; the lack of trained policewomen was felt to be a handicap.

The Survey, in commenting upon the situation in Philadelphia, expresses the opinion that what is especially needed is leadership, both by a whole-time division chief for venereal diseases in the Health Department and among the non-official health agencies, and a program, chiefly of education and compliance with the law.

Massachusetts is fortunate in having an energetic leader in charge of the venereal division of the State Department of Health, while unification of effort results from the activities of the Massachusetts Society for Social Hygiene, which is in close touch with the State Department of Health. In spite of these advantages, many of the undesirable conditions found to exist in Philadelphia may also be found here. A study of these conditions and of the remedies suggested by the Philadelphia Hospital and Health Survey will help us in Massachusetts to deal with this ever-present problem. Syphilis and gonorrhea are preventable diseases. That they continue to flourish is a profound reflection upon our civilization, a challenge from which we cannot turn away.

HAVE FAITH IN MASSACHUSETTS

REGARDLESS of the unanimity with which they may agree on other questions, the towns and cities of Massachusetts can be relied upon not to indulge in any one hundred per cent. coöperative effort for the control of rabies. In June, according to the State Department of Public Health, we passed through the worst "mad dog" month in the history of the state. During this month three Massachusetts citizens died, fifty received anti-rabic treatment, and 878 were bitten by dogs. The number of persons bitten was nearly 200 greater than in the corresponding month a year ago, and 36 were shown to have rabies as against 19 in June, 1930.

During the month rabies appeared for the first time this year in Billerica, Burlington, Charlton, Clinton, Enfield, Ludlow, Mendon, Millville, Oxford, Reading, Swampscott, Wakefield and Winchester. What have we done for the control of this situation? Boston, Newton, Cambridge, Clinton, Ludlow, Lawrence and other cities and towns have adopted orders requiring a 90-day restraint period, unmuzzled dogs on the street to be restrained. Worcester and Pittsfield, with five and four proven cases of animal rabies, respectively, continue to be focal points for the disease, and Worcester authorities have declined to issue the restraining order.

We are lovers of dogs, most of us, and we respect the man who loves his dog, but we respect still more him who loves his fellow-man.

THIS WEEK'S ISSUE

CONTAINS articles by the following named authors:

ROSS, WILLIAM H. M.D. Medical Department of Columbia University, 1888. Attending Physician, Southside Hospital, Bay Shore, New York. Consulting Physician, Central Islip State Hospital, Central Islip, New York. Former President, Medical Board, Southside Hospital, Bay Shore, New York. President, Suffolk County (N. Y.) Board of Health. Former President, Medical Society of the State of New York. His subject is: "Problems in Medical Service." Page 68. Address: Brentwood, New York.

RÖSLER, HUGO. M.D. Vienna. Roentgenologist, Herzstation and Poliklinik, Vienna. Traveling Fellow of the Rockefeller Foundation 1930-1931. His subject is: "Methods of Cardiovascular Study by the Roentgen Ray." Page 77. Address: Herzstation, Pelikangasse, Wien, Austria.

SOSMAN, MERRILL. A.B., M.D. Johns Hopkins University Medical School 1917. Roentgenologist, Peter Bent Brigham Hospital. Assistant Professor in Roentgenology, Harvard Medical School. Consulting Roentgenologist, C. P. Huntington Memorial Hospital, and Peabody Home for Crippled Children. Associate in Roentgenology, Children's Hospital. His subject is: "Roentgen Study of the Heart." Page 80. Address: 721 Huntington Avenue, Boston.

SPROULL, JOHN. M.D. Boston University School of Medicine 1901. Member of Staff and Roentgenologist to the Hale Hospital, Haverhill, Mass. His subject is: "Roentgen Study of the Thoracic Aorta." Page 83. Address: 50 Merrimack Street, Haverhill, Mass.

FAULKNER, JAMES M. A.B., M.D. Harvard University School of Medicine 1924. Junior Visiting Physician, Boston City Hospital. Assistant in Medicine, Harvard Medical School. His subject is: "Methods of Electrocardiography and the Normal Electrocardiogram." Page 88. Address: 264 Beacon Street, Boston.

DRAKE, E. H. A.B., M.D. Bowdoin Medical School 1919. Attending Physician, Maine General Hospital. His subject is: "The Use of the Electrocardiograph in the Study of Cardiac Arrhythmias, Bradycardia, and Tachycardia." Page 92. Address: 58 Deering Street, Portland, Maine.

HURXTHAL, LEWIS M. M.D. Harvard University School of Medicine 1923. In charge of Medical Department, Lahey Clinic. His subject is: "The Clinical Significance of Abnormalities of the Electrocardiographic Complexes (Abstract)." Page 95. Address: 605 Commonwealth Avenue, Boston.

RUSHMORE, STEPHEN. A.B., M.D. Johns Hopkins University Medical Department, 1902. F.A.C.S. His subject is: "Junior Staff Appointments: An Educational Responsibility." Page 103. Address: 520 Commonwealth Avenue, Boston.

MISCELLANY

A BROADCASTING MESSAGE PREPARED AND SPONSORED BY THE COMMITTEE ON PUBLIC EDUCATION OF THE MASSACHUSETTS MEDICAL SOCIETY FOR THE DEPARTMENT OF PUBLIC HEALTH

QUACKS AND QUACKERY*

The subject of quacks and quackeries, which has been assigned to me, is one which touches each of you at some period of your lives. The quack doctor has been with us since the dawn of history. He may be a frank fakir, but often he is an ignorant individual who really believes in what he is doing. It is most important to emphasize methods of avoiding the quack, and this is most easily done by making sure of the qualifications of anyone whom you may consult in relation to body ills. The public demands that anyone treating the sick have a proper background of training and knowledge. The practice of medicine is safeguarded by the State Laws, both in relation to the licensing of physicians and the supervision of schools. It is important that one be sure that the man who is treating you makes an honest and and persistent effort to find out what is the matter before he begins treatment. It should be emphasized that no single method of treatment will suffice to cure all ills.

Now considerable time is usually required to make the necessary examinations though, of course, in an emergency it is often necessary to act quickly. But the subject that we are discussing is one which is of more importance in dealing with chronic disease than in medical emergencies. From this it is evident that any person alleging to treat the sick, who does not take great care in attempting to find out exactly what is the matter, before beginning treatment, may be a quack.

It has always been the custom of the medical profession not to advertise; consequently, the doctor who advertises is breaking one of the most universally adopted principles of our social behavior and, as the second general rule, it is fair to say, beware of the doctor who advertises!

The reputable physician usually displays his State Board License and has, or has had professional affiliations with some reputable medical institution. His office is likely to be in an area frequented by other doctors, whereas the quack's is often in a commercial district, usually too grand, and rarely in a district with other physicians. Also, a letter to the State Board of Registration in Medicine, or inquiries amongst the standard medical organizations of a community will give you information about anyone whom you may consider consulting.

So, then, we have four important things to consider in the patient's estimate of the doctor. First, his State Board License; second, the time and care he devotes to the examination and questioning of the patient; third, his professional affiliations; and, fourth, that he does not advertise.

In the term quackery, we can include not only the thousands of advertised medicines which are entirely worthless, but also the exaggerated advertising claims for treatments and medicines of limited value.

The Post Office Department is active in exposing frank frauds that use the mails. Notable amongst these are the ones which allege that they employ electricity in various forms. A common device consists of bottles from which protrude two wires, one of which is to be held in each hand. Between them is found a switch with button connections. This is supposed to regulate the amount of electricity that is generated, which is exactly none at all, and a number of these bottles, which have been opened by the Post Office Department, have been found to contain nothing but dirt. Another favorite device plays on the widely known fact that alternating copper and zinc plates are used in batteries. One of the simplest of these has recently been exposed. This consists of a copper plate to be worn in the right shoe and a zinc plate in the left shoe, thereby, according to the advertisement, generating invigorating electricity to pass through the body. Of course, this produces no electricity and, if it did, it would not produce invigoration. Some of these frauds are rather amusing, such as a rubber suction cap on the principle of the old-fashioned dry cup, which is advertised for weight-reducing purposes, the cup to be applied to the part which is to be reduced. A recent cure for baldness and toothache has been advertised under the name of the infra-red Cap. This consists of a small, black bonnet with a dingy electric heating coil covered with asbestos. When the electrical connection was plugged in, the coil warmed the top of the wearer's head. By this means, so the advertisement said, the cap gave off penetrating infra-red rays that entered the scalp and stimulated the roots of the hair. It is well known that the infra-red rays do not penetrate and that such a coil would give off about as many infra-red rays as a hot water bottle, which is none, and would be just about as useful in stimulating the growth of hair. These are, perhaps, enough examples to illustrate frank frauds.

As to extravagantly worded advertisements, I have used our local papers and, at the time this talk was written which was during the winter, I found four or five advertisements for the cure of colds, each stating that it was the only thing that did the job properly. To be more specific, one of these claimed that the medicine checked the cold, reduced the fever, cleansed the system, relieved the headache

*WBZA radio broadcast June 17, 1931 at 5.20 P. M.

and finally, cautioned you to refuse remedies which only gave temporary relief. I might add, that so far as we know, there is no known cure for colds, so that all remedies are necessarily in the form of relief. However, on the same day, another advertisement claimed that the substance quoted, "was the quickest way to knock a cold", and describes itself as a scientific formula made to do one thing well. There were three others in the same paper, one of which provided testimonials from a well-known person. As I mentioned, these advertisements were very timely. They appeared during the season of colds and winter infections. None of these advertisements mentioned the extreme importance of going to bed with severe infections, and of watching out for the complications of colds. I looked into these substances and, so far as I can make out, none of them are harmful in themselves in the dosage that is recommended. One of the great objections is that they may give a false sense of security and delay, or prevent, the institution of proper precautionary measures against the complications and results of cold.

On these same days, in the same newspapers, I found another group of advertisements relating to beautification, and even advertising cosmetic surgery to change any face that may be unsatisfactory to its owner.

At all seasons of the year, one finds in the newspapers and magazines advertisements for the relief of stomach ills. Indigestion can be treated, according to the advertisements, very simply. Unfortunately, this is one of the symptoms of a great many diseases, and it is highly important for any individual who is troubled frequently, or constantly, with indigestion to consult his physician, because this may be an indication of serious disease. Many of the advertised remedies for indigestion, contain as their only active ingredient ordinary baking soda, and a very large proportion of cases may be temporarily relieved by soda, but the temporary relief, gained in this way, may delay the finding of the underlying disease for many months, and until it is so far advanced, that it is very difficult or impossible to treat. Constipation and acidity are also treated in the advertisements, on this same day, but time does not permit going into detail about this group of advertisements.

I have just tried to touch the high spots by various examples, and particularly those from our local newspapers. Many more can be mentioned. This whole matter boils down to the consideration of how to avoid three things: first, the advertising quack who pretends to accomplish cures and, thereby, often lulls the patient into a false sense of security until the time had passed when something may be done; secondly, do not believe the advertisements without carefully analyzing them, when you will find that the statements, while not actually false, are misleading if read hastily; and, thirdly, do not take medicines of which your physician cannot tell you the composition. Usually they are largely inert. As a matter of safety, go to your nearest, regularly licensed physician for treatment, and avoid buying advertised cures. The employment of quack doctors and advertised cures may be considered forms of self-medication which, without a knowledge of the underlying cause of your symptoms, will almost inevitably lead into serious difficulty.

HENRY ASBURY CHRISTIAN

On June 17 Dr. Henry A. Christian was presented for the degree of Doctor of Laws at Western Reserve University, with the following words:

Mr. President:

I have the honor to present to you HENRY ASBURY CHRISTIAN, Bachelor and Master of Arts of Randolph Macon College, Master of Arts of Harvard University, Doctor of Medicine of Johns Hopkins University, Doctor of Laws, honoris causa, of Randolph Macon College, Professor of the Theory and Practice of Physic in the Harvard University Medicine School, a great and resourceful physician, an outstanding student of medicine, a builder of a University clinic in which his lofty ideals and generous spirit have been imparted to many pupils and from which, in consequence, has sprung a school of teachers, clinicians and investigators.

On behalf of the Faculty of Western Reserve University, I present him to you that he may be admitted to the degree of Doctor of Laws, honoris causa, of this University.

BEQUEST TO COMBAT CANCER

More than $1,500,000 has been left by Egbert Chaplin of Branford, Connecticut, a manufacturer of bookbinding machinery, to aid in the fight against cancer. The executors will decide how the fund is to be applied after consultation with medical authorities, according to a report in the New York Times.

MENTAL PATIENTS INCREASE

W. L. Treadway, assistant surgeon general of the Public Health Service, has stated in an editorial before the Southern Medical Association that approximately 324 persons in each 100,000 of the general population are confined to hospitals for mental and nervous diseases as compared with 192 in general hospitals. Dr. Treadway showed that 45.7 per cent. of all hospital beds in the United States are devoted to the care of mental and nervous diseases, and 95.4 per cent. of these are occupied. Last year 128,964 new patients were admitted to these hospitals and 25,445 were readmitted. Approximately 40 per cent. of all persons applying for medical advice at public clinics or dispensaries are suffering from some mild form of mental illness.

CORRESPONDENCE

CORRECTION OF AN ERROR

July 1, 1931.

Editor, *New England Journal of Medicine:*

When I submitted my article on BLASTOMYCOSIS*, Report of a Case, by error there was no mention made of my connection with the Boston City Hospital. I wish to state that this case in the report was made from the Dermatological Department at the Boston City Hospital.

Very truly yours,

J. G. DOWNING.

*New Eng. J. Med. 204:1259, June 11, 1931.

SEASONAL SYMPTOMS

To the Editor of The *New England Journal of Medicine.*

Sir:—

Luigi Cornaro, famous Venetian centenarian, in his book "La Vita Sobria" attributed his long life to temperate habits. At the age of about forty he was a physical wreck. He took himself in hand, and regulated his habits and manner of living, especially his diet, which he gradually reduced in quantity as he grew older. In the summer time he was subject to a peculiar weakness or lassitude of a grave character, which he attributed to an idiosyncrasy of his constitution. Nothing overcame this weakness but the new wine he used to drink as soon as it was ready in the fall. Old wine would not do; he had to have this new wine.

Many persons are subject to complaints that recur at the same time every year. Hay fever is a notable case in point. My own hay fever, of twenty-five or thirty years' duration, recurs at about the same time every year, and disappears about the same time. I hardly regard hay fever as pathological, but am inclined to regard it as a natural phenomenon peculiar to certain persons, just as a high degree of nervous energy and its manifestations is peculiar and natural to certain persons. I used to doctor it a little, but now I just grin (or try to) and bear it. I am not in favor of the serum treatment for hay fever. I think that it is perhaps good for those who have hay fever to get rid of the mucous secretion. I have always had a notion that hay fever has some relation to the sex life.

Rheumatism, lumbago, "dead fingers", palpitation of the heart, vertigo, "spring fever", changes in the urine, pimples, boils, and other complaints also recur periodically, perhaps in the spring and fall more than at other seasons. Sometimes pimples break out on the same part of the face and body from year to year. People should not be unduly alarmed at these symptoms. I think that they are related to the adjustments the body makes to changes of temperatures and foods and to other conditions, and also to the seasonal changes in the sex life and to the times of "rut".

Yours very truly,

CHARLES HOOPER.

Coeur d'Alene, Idaho,
June 20, 1931.

RECENT DEATHS

PORTER—The *Journal* chronicles with regret the death of the brilliant Boston surgeon, CHARLES ALLEN PORTER, who died at the Massachusetts General Hospital where he had so long been visiting surgeon, of inoperable cancer of the stomach, July 3, 1931, at the age of 64.

He is survived by his widow, who was Miss Margaret Cochran Dewar, of Glasgow, Scotland, and by a son, named for his grandfather, Dr. Charles Burnham Porter, also an eminent surgeon of Boston, and by two daughters.

JOHNSON—DR. WILLIAM LOUIS JOHNSON of Uxbridge, practising physician, medical examiner, orator, representative in the Legislature, school committeeman, died in St. Vincent Hospital, Worcester, following an operation, July 3, 1931, aged 74.

Born in Southborough, October 23, 1856, he was educated in the public schools of Worcester and Cambridge and at Harvard Medical School, where he took his M.D. in the class of 1878. He joined the Massachusetts Medical Society in that year and settled in Uxbridge. Later, and for many years he represented the Worcester District Medical Society in the Council of the state society. In Uxbridge he held many offices of trust and honor. He was moderator of the Congregational Church, treasurer of the Mendon Historical Society, member of the Thurber Medical Association and Aesculapian Club, and of the Solomon's Temple, Lodge of Masons. He acted as town moderator for many years, was a member of the school committee and of the town board of health and was district examining physician for the Metropolitan Life Insurance Company. Beginning in 1898 Dr. Johnson was medical examiner of the seventh Worcester district for several terms. He was a past grand master of the Massachusetts Court of the Foresters of America and a member of that court for 45 years.

Dr. Johnson is survived by his widow, Mrs. Adelaide Johnson and by three married daughters, three sisters and a brother, Professor George Johnson of Case University, Cleveland, Ohio.

POLAK—DR. JOHN OSBORN POLAK, president of Long Island College Hospital and a leading obstetrician, has recently died at the age of sixty-one years. It is said that Dr. Polak was one of the original users of radium in this country.

Dr. Polak first attended Rutgers College, but took his bachelor of science degree at the University of Vermont in 1889. His medical degree was taken at Long Island College Hospital in 1891. For

fifteeen years he was a professor in the New York Post Graduate Medical School and Hospital.

Dr. Polak was a Fellow of the American College of Surgeons, the American Medical Association and the New York Academy of Medicine, being also vice president of the last named and a member of its council; a member of the editorial board of *The American Journal of Surgery* and the advisory editorial board of *The American Journal of Obstetrics and Gynecology* and chairman of subcommittee two on parental, maternal and early infant care, of the White House conference on child health and protection. He belonged also to the Associated Anaesthetists of the United States and Canada, and the American Association of Obstetricians, Gynecologists and Abdominal Surgeons.

KENNEY—Dr. Clarence Bronson Kenney, a Fellow of the Massachusetts Medical Society, died at his home in Winchendon, July 1, 1931, aged 45 years.

Dr. Kenney was a graduate of the Tufts College Medical School in 1910. He joined the Massachusetts Medical Society from the State Farm, Bridgewater, in 1913, and moved to Winchendon in 1916, where he had been since. He had an honorable record in the Army during the World War and was a prominent practitioner of Winchendon. Dr. Kenney is survived by his widow.

STERNE—Dr. Albert Eugene Sterne, professor of nervous and mental diseases at The School of Medicine of Indiana University, has recently died in Denver, Colorado, at the age of sixty-five years. Dr. Sterne, whose home was in Indianapolis, had just arrived in Denver after attending the meeting of the American Medical Association in Philadelphia.

A native of Cincinnati, Dr. Stone was graduated from Harvard in 1887, and was given his medical degree by the University of Berlin in 1891. He also studied at Strasbourg, Paris, Vienna, London and Dublin.

OBITUARY

RESOLUTIONS ON THE DEATH OF DR. GEORGE W. GAY

By the death of Dr. George W. Gay the Boston City Hospital has lost a wise counsellor, a devoted servant and an untiring friend. He began to walk its wards as a medical student in 1864, the year of its opening, and in 1867 he received an appointment as House Officer. He became Surgeon to Out-Patients in 1869, and from that time until his death his name appears constantly on its roster. It is an unrivalled record for length of service, and it has never been excelled in devotion to the interests of the Hospital. Though burdened with a large family and consultation practice, he gave to it ungrudgingly of his time and skill. The immediate need of the individual and not his private interest determined his choice between conflicting calls from private and hospital patients. As a surgeon he was skillful, resourceful and bold, when boldness was the conservative course, and by his courage and success in the earlier days of modern surgery became an important factor in its development.

Born of old New England stock, he inherited its sterling traits. Among his most outstanding qualities was loyalty, loyalty to his profession, to his hospital, his friends and his own high ideals, and he was fortunate in receiving a just reward. The Massachusetts Medical Society honored him by making him its President and his colleagues at the Hospital elected him as President of the Staff. He gave distinguished and unselfish service in both positions. Patients recognized his high qualities of mind and heart and hand and flocked to him in almost embarrassing numbers, and their confidence in his wisdom, skill and kindly interest was never betrayed. He worshiped his profession, and fearing what he believed to be a growing tendency toward its commercialization he endowed a lectureship in the Harvard Medical School through which he hoped that youthful medical men might be imbued with those ideals of medical ethics and practice which had inspired his own career.

High standards of conduct, independence of judgment, integrity of purpose, consideration of others, intellectual honesty and unflagging industry marked his course during a long and singularly useful life.

The Trustees of the Hospital wish to record their appreciation of his services to the Hospital and of his qualities as a man and a surgeon, and to express to his family their heartfelt sympathy in their sorrow.

George G. Sears, M.D.

NEWS ITEM

AMERICAN SURGICAL ASSOCIATION — Dr. Charles H. Mayo of Rochester, Minnesota, was elected president of the American Surgical Association which closed its San Francisco convention on July 1.

Dr. Lincoln Davis, Boston, was elected vice president; Dr. Jonathan M. Wainwright of Scranton, Penn., second vice president; Dr. Vernon David of Chicago, secretary; Dr. Eugene H. Pool of New York, treasurer, and Dr. Walter E. Lee of Philadelphia, recorder.

The 1932 meeting will be held in New Haven, Connecticut.

NOTICES

COMPETITION FOR PAMPHLET ON SEX HYGIENE

The Massachusetts Society for Social Hygiene announces a competition to secure a suitable manuscript for publication on sex hygiene, designed for adolescent boys and girls. An award of $500 is offered to the author of the manuscript selected.

Further information may be obtained from the Society headquarters, 1150 Little Building, Boston, Mass.

APPOINTMENTS AT THE HARVARD MEDICAL SCHOOL JUNE 26, 1931

Appointments for the academic year 1931-32:

Assistants

Frank Andrew Hamilton in Anatomy
Harold Valmore Hyde in Anatomy and Gynaecology
Reginald Dimock Margeson in Anatomy and Gynaecology
George Calvin Prather in Anatomy
William Martindale Shedden in Anatomy
Monroe Davis Eaton, Jr., in Bacteriology and Immunology
LeRoy Dryden Fothergill in Bacteriology and Immunology and in Pediatrics
Eliot Furness Porter in Bacteriology and Immunology
Austin Walter Cheever in Dermatology and Syphilology
John Godwin Downing in Dermatology and Syphilology
Carmi Rupert Alden in Gynaecology
Joseph Powitzer Cohen in Gynaecology
Frederick James Lynch in Gynaecology
George Elliott May in Gynaecology
John Rock in Gynaecology and Obstetrics
Edward Bernard Sheehan in Gynaecology
Abraham Solomon Troupin in Gynaecology
Maurice George Evans in Laryngology
Robert Lincoln Goodale in Laryngology
Charles Isaac Johnson in Laryngology
Francis Lee Weille in Laryngology and Otology
George Henry Wright in Laryngology
Edward Alexander Bartram in Medicine
Harry Blotner in Medicine
Allen Gilbert Brailey in Medicine
Randall Clifford in Medicine
Harry Aaron Derow in Medicine
William Chauncey Egloff in Medicine
Laurence Brewster Ellis in Medicine
James Morison Faulkner in Medicine
Maxwell Finland in Medicine
Marshall Nairne Fulton in Medicine
Samuel Leon Gargill in Medicine
Clark Wright Heath in Medicine
Donald Clare Hoffman in Medicine
Donald Storrs King in Medicine
Richard Bruce King in Medicine
Hyman Louis Kramer in Medicine
Jacob Lerman in Medicine
Frank William Marlow, Jr., in Medicine
Ovid Otto Meyer in Medicine
Hyman Allan Novack in Medicine
Robert Sterling Palmer in Medicine
George Phillips Reynolds in Medicine
Wyman Richardson in Medicine
George Porter Robb in Medicine
Richard Pratt Stetson in Medicine
William Borden Stevens in Medicine
James Harvey Townsend in Medicine
Eugene Chellis Glover in Medicine
Richard Glenn Hahn in Medicine
Aubrey Otis Hampton in Roentgenology
Max Ritvo in Roentgenology
Samuel Alexander Robins in Roentgenology
George Colket Caner in Neurology
Charles Soucek Kubik in Neurology and Neuropathology
Jacob Ellis Finesinger in Neuropathology
Hiram Houston Merritt, Jr., in Neuropathology
Lawrence Raymond Morrison in Neuropathology
Paul Ivan Yakovlev in Neuropathology
Ives Hendrick in Psychiatry
Saul Berman in Obstetrics
John Anthony Coyne in Obstetrics
Marion Fletcher Eades in Obstetrics
Paul Gustafson in Obstetrics
Meinolph Valen Kappius in Obstetrics
Judson Arthur Smith in Obstetrics
William Tecumseh Sherman Thorndike in Obstetrics
William Bartholomew Young in Obstetrics
Virgil Glenn Casten in Ophthalmology
Paul Austin Chandler in Ophthalmology
Edwin Blakeslee Dunphy in Ophthalmology
Merrill Jenks King in Ophthalmology
Harry Knowles Messenger in Ophthalmology
Benjamin Sachs in Ophthalmology
Theodore Lasater Terry in Ophthalmology
Joseph Seaton Barr in Orthopaedic Surgery
Edwin French Cave in Orthopaedic Surgery
William Thomas Green in Orthopaedic Surgery
John Grove Kuhns in Orthopaedic Surgery
Robert Hartshorne Morris in Orthopaedic Surgery
Sumner Mead Roberts in Orthopaedic Surgery
William Alexander Rogers in Orthopaedic Surgery
Moses Hyman Lurie in Otology
Leon Edward White in Otology
John Ignatius Bradley in Pathology
Louis Klein Diamond in Pathology and in Pediatrics
Ralph Lynn Irwin in Pathology
Rudolf Osgood in Pathology
James Marvin Baty in Pediatrics
Stewart Hilton Clifford in Pediatrics and Child Hygiene
Robert Dudley Curtis in Pediatrics
Richard Cannon Eley in Pediatrics and Communicable Diseases
Wheaton Fregeau in Pediatrics
Robert Norton Ganz in Pediatrics
Stanton Garfield in Pediatrics and Child Hygiene
Henry Louis George in Pediatrics
Eliot Horton Luther in Pediatrics
Arthur Bates Lyon in Pediatrics
Wilfred Lawrence McKenzie in Pediatrics
Harvey Spencer in Pediatrics and Child Hygiene
Clement Andrew Smith in Pediatrics
Lewis Kaigler Sweet in Pediatrics
Robert Henry Aldrich in Surgery
Gordon Douglas Atkinson in Genito-Urinary Surgery
Franklin Greene Balch, Jr., in Surgery
Edward Benson Benedict in Surgery
Newton Clarence Browder in Surgery
Fletcher Hatch Colby in Genito-Urinary Surgery
Edward Anthony Cooney in Surgery

Oliver Cope in Surgery
Allan Littlefield Davis in Surgery
Herbert George Dunphy in Surgery
Jacob Fine in Surgery
Torr Wagner Harmer in Surgery
Edwin Parker Hayden in Surgery
Henry William Hudson, Jr., in Surgery
Franc Douglas Ingraham in Surgery
Thomas Hinckley Lanman in Surgery
Robert Ritchie Linton in Surgery
Stephen James Maddock in Surgery
Patrick James Mahoney in Surgery
Richard Meagher in Surgery
Prodromos Nicholas Papas in Genito-Urinary Surgery
Thomas Howard Peterson in Genito-Urinary Surgery
Lyman Gilder Richards in Surgery
Horatio Rogers in Surgery
Richard Ilsley Smith in Surgery
Grantley Walder Taylor in Surgery
Augustus Thorndike, Jr., in Surgery
William Allen White, Jr., in Surgery
Albert Aurelius Hornor in Tropical Medicine
Maurice Benjamin Strauss in Tropical Medicine

Associates

Francis Browne Grinnell in Bacteriology and Immunology
Maynard Ladd in Pediatrics
Conrad Wesselhoeft in Communicable Diseases
Joseph Williams Schereschewsky in Preventive Medicine and Hygiene
Daniel Fiske Jones in Surgery
Channing Chamberlain Simmons in Surgery
Wyman Whitemore in Surgery

Austin Teaching Fellow

Yellapragada Subba Row in Biological Chemistry

Instructors

Torr Wagner Harmer in Anatomy
John Franklin Enders in Bacteriology and Immunology
William Augustus Hinton in Bacteriology and Immunology and in Preventive Medicine and Hygiene
Robert Nason Nye in Bacteriology and Immunology
Elliott Stirling Andrew Robinson in Bacteriology and Immunology and in Preventive Medicine and Hygiene
George Alfred Dix in Dermatology and Syphilology
Arthur Moses Greenwood in Dermatology and Syphilology
Edward Winslow Karcher in Dermatology and Syphilology
Clarence Guy Lane in Dermatology and Syphilology
Jacob Hyams Swartz in Dermatology and Syphilology
Frederick Leo Good in Gynaecology
Robert Montraville Green in Gynaecology
Frank Arthur Pemberton in Gynaecology
Richard Goodwin Wadsworth in Gynaecology
John Thomas Williams in Gynaecology
Harry Aldrich Barnes in Laryngology
Frederick Eugene Garland in Laryngology
Edwards Woodbridge Herman in Laryngology
Charles Davison Knowlton in Laryngology
Duncan Campbell Smyth in Laryngology
Harold Grant Tobey in Laryngology
William Irving Wiggin in Laryngology
Fuller Albright in Medicine
Thomas Duckett Jones in Medicine
William Parry Murphy in Medicine
Wheelan Dwight Sutliff in Medicine
Edward Charles Vogt in Roentgenology
Louis Wolff in Medicine
George Clymer in Neurology
William Herman in Psychiatry
William Gordon Lennox in Neuropathology
Donald John MacPherson in Neuropathology
Charles Anthony McDonald in Neurology
Martin William Peck in Psychiatry
Moses Ralph Kaufman in Psychiatry
Oscar Jacobus Raeder in Psychiatry
Kenneth James Tillotson in Psychiatry
Henry Rouse Viets in Neurology
Frederic Lyman Wells in Experimental Psychopathology
Delos Judson Bristol, Jr., in Obstetrics
Robert Laurent DeNormandie in Obstetrics
Foster Standish Kellogg in Obstetrics
John Baker Swift, Jr., in Obstetrics
Hugo Bruno Carl Riemer in Ophthalmology
Albert Howell Brewster in Orthopaedic Surgery
Lloyd Thornton Brown in Orthopaedic Surgery
Henry Joseph FitzSimmons in Orthopaedic Surgery
Robert Soutter in Orthopaedic Surgery
Loring Tiffany Swaim in Orthopaedic Surgery
George Wilson Van Gorder in Orthopaedic Surgery
Frederick Leon Bogan in Otology
Philip Edward Meltzer in Otology
Charles Terrell Porter in Otology
Irving Benjamin Akerson in Pathology
Granville Allison Bennett in Pathology
Sidney Farber in Pathology
George Marvin Hass in Pathology
Percy Rogers Howe in Pathology
Valy Menkin in Pathology
James Stewart Rooney in Pathology
Reuben Zeiten Schulz in Pathology
Hans Theiler in Comparative Pathology
Randolph Kunhardt Byers in Pediatrics
Paul Waldo Emerson in Pediatrics
Richard Spelman Eustis in Pediatrics
Joseph Garland in Pediatrics
Lewis Webb Hill in Pediatrics
Gerard Norton Hoeffel in Pediatrics
Eliot Hubbard, Jr., in Pediatrics
Eli Charles Romberg in Pediatrics
Warren Richards Sisson in Pediatrics
Abraham Solomon Small in Pediatrics and Child Hygiene
Philip Haskell Sylvester in Pediatrics
Richard Carlisle Tefft, Jr., in Pediatrics
James Leroy Wilson in Pediatrics
Edwin Theodore Wyman in Pediatrics
Henry Ezra Gallup in Pediatrics
Edward Charles Smith in Communicable Diseases
Magnus Ingstrup Gregersen in Physiology
Gordon Clark Ring in Physiology

Sidney David Kramer in Preventive Medicine and Hygiene
Arthur Wilburn Allen in Surgery
George David Cutler in Surgery
Ernest Merrill Daland in Surgery
Harry Fairbanks Hartwell in Surgery
Stanley John Gregory Nowak in Surgery
Luther Gordon Paul in Surgery
Thomas Kinsman Richards in Surgery
Alpha Reuben Sawyer in Genito-Urinary Surgery
James Clarke White in Surgery
Edward Lorraine Young, Jr., in Surgery
Jack Henry Sandground in Tropical Helminthology

Lecturers

Carlos Chagas on Tropical Medicine
William Edgar Deeks on Tropical Medicine
Alexander Hamilton Rice on Diseases of South America

Research Associates

Thomas Leroy McMeekin in Physical Chemistry
Mary Elizabeth Dailey in Neuropathology
Eva Elizabeth Jones in Comparative Pathology
Elizabeth Evans Lord in Pediatrics
Roy Graham Hoskins in Physiology

Research Fellows

Maximiliano Ruiz Castaneda in Bacteriology and Immunology
Joyce Wright in Bacteriology
Teodoro Schlossberg in Gynaecology
George Van Siclen Smith in Gynaecology
Francis Lee Weille in Laryngology
Edward Franklin Bland in Medicine
Douglas Richard Drury in Medicine
Douglas Goldman in Medicine
Robert Charles Levy in Medicine
William Thomas Salter in Medicine
Francis Henry Laskey Taylor in Medicine
Dorothy Rourke Gilligan in Medicine
Walter Kendall Myers in Medicine
Theodore Wright Oppel in Medicine
Frederick Herman Scharles in Medicine
Harold Herbert Rosenblum in Medicine
William Hanlon Oatway, Jr., in Obstetrics
Gaylord Palmer Coon in Psychiatry
Frank Christian d'Elseaux in Psychiatry
Oliver Spurgeon English in Psychiatry
Henry Stone Forbes in Neuropathology
Leon Joseph Saul in Psychiatry
William Clifford Munroe Scott in Psychiatry
Jackson Mash Thomas in Psychiatry
Donald Macomber in Obstetrics
Clyde Edgar Keeler in Ophthalmology
Miriam Friedman Menkin in Pathology
Charles Ernest Snelling in Pediatrics
Norman Easton Freeman in Physiology
Milton Oliver Lee in Physiology
Margaret Elizabeth MacKay in Physiology
Robert Allan Phillips in Physiology
Egon Lorenz in Preventive Medicine and Hygiene
Murray Jacob Shear in Preventive Medicine and Hygiene

Teaching Fellows

George Pengwerne Matthews in Histology
Charles Alexander Lamb in Histology
Augustus Steele Rose in Histology
Irvin Sigwald Danielson in Biological Chemistry
George Herbert Hitchings in Biological Chemistry
Carl Joseph Klemme in Biological Chemistry
Norwood Korter Schaffer in Biological Chemistry
Chester William Hampel in Physiology
James Oliver Pinkston in Physiology
Fuller Albright, Henry P. Walcott Fellow in Clinical Medicine
Claude Ellis Forkner, Francis Weld Peabody Fellow in Medicine
John Warner Parsons, Charles Follen Folsom Teaching Fellow in Hygiene
Richard Upjohn Light, Arthur Tracy Cabot Fellow in charge of Laboratory of Surgical Research
Reginald Fitz, Physician to Students
John Molloy Flynn, Assistant Physician to Students
Worth Hale, Assistant Dean of the Medical School
Frank Roberts Ober, Assistant Dean in charge of Courses for Graduates
Herbert Walker, Instructor in Physical Education

From January 1, to September 1, 1932:

Edwin Muncks Cole, Assistant in Neurology

From May 1 to November 1, 1931:

Kenneth Wade Thompson, Research Fellow in Surgery

SOCIETY MEETINGS

CONGRESSES AND CONFERENCES

July 26-31—Third Congress of the Pan American Medical Association. See page 632, issue of March 19.

July 27—The Post Graduate Course of Ear, Nose and Throat Surgery at the University of Bordeaux, France. See page 951, issue of April 30.

July 27-31—Third International Congress of Radiology, Paris. See page 789, issue of April 9.

August 3-8—The International Congress of Industrial Accidents and Diseases. See page 1330, issue of June 18.

Aug. 31 - Sept. 4—Neurologists will meet in Berne, Switzerland. See page 896, issue of April 23.

September 14-17—The American Public Health Association. See page 632, issue of March 19.

October 12-16—An Announcement of the Clinical Congress of the American College of Surgeons. See page 1175, issue of May 28.

October 19-22—The Interstate Post Graduate Medical Association of North America. See page 1125, issue of May 21.

October 19-30—Graduate Fortnight of the New York Academy of Medicine. See page 1230, issue of June 4.

April 4-8, 1932—The American College of Physicians. See notice on page 1232, issue of June 4.

DISTRICT MEDICAL SOCIETIES

Bristol North District Medical Society

September 17—Details to be announced.

Plymouth District Medical Society

July 17—Midsummer meeting. See page 1011, issue of May 7.

BOOK REVIEWS

Fighting Disease with Drugs. The Story of Pharmacy. A Symposium. Edited by John C. Krantz, Jr. Published for the National Conference of Pharmaceutical Research. The Williams & Wilkins Company. Price $2.00.

This work is written by some of the men most prominent in pharmacy, pharmaceutical botany, and organic chemistry in the United States.

The title is scarcely descriptive of the contents. The book treats very little of the actual use of drugs in "fighting disease". It deals largely with the sources of drugs, what they contain, how they are made available to the patient and how their quality is controlled. It is an interesting story of how crude products of the "mineral, vegetable and animal kingdoms" are drawn upon to supply drugs for the relief of pain and the cure or prevention of disease and how these sources are being supplemented at an ever-increasing rate from the inexhaustible field of synthetic organic chemistry.

Perhaps the point which will most impress the thoughtful reader will be the realizaton of how far in advance of the medical profession the pharmacist and chemist have so often been; how, for example, there was an interval of three centuries between the discovery of ether and its application for the prevention of pain. Decades passed between the discovery of nitrous oxide, ethylene, ethyl chloride, cocaine, chloral hydrate, acetanilide, amyl nitrite, etc., and their use in medicine. And when he reads of the more than 250,000 organic chemicals already known to chemists (and about twenty new ones are reported every day) and realizes that few of these have been tested for possible therapeutic virtues, he may well wonder if he is not still living in as dark a period as when for more than two decades ether was in the pharmacy but not in the operating room of the Massachusetts General Hospital, when phenol (the introduction of which ushered in the era of antiseptic and aseptic surgery) was used only as a deodorant for sewage, when carbon tetrachloride (with which the Rockefeller Foundation, after learning of its medical use from a veterinarian, boasts of having cured 10,000,000 human beings of the hookworm disease) was used chiefly by rag pickers and manufacturers of fire extinguishers. And when he reads a recent statement of learned pathological anatomists demonstrating (to their own satisfaction) the futility of hoping to find a drug which will modify the growth of cancer, he will probably think of the conclusive demonstrations by learned physiologists and surgeons, of the futility of seeking a drug which would produce anesthesia or of one which would check putrefactions in wounds.

The chemists and pharmacists were probably stimulated to write this book by the fact that few American medical schools and institutes for medical research are paying attention to this subject; nearly all of the fundamental advances which have been made in the last sixty years have come from the German university pharmacological laboratories, and special institutes.

The book contains a number of interesting illustrations showing the status of pharmacy at different periods, portraits of famous pharmacists and chemists, etc. Perhaps it is claiming a little too much to introduce the famous picture of Sir Humphry Davy's laboratory at the Royal Institution (with the youthful Faraday) as "A Typical Pharmaceutical Laboratory of the Early Nineteenth Century."

The value of the book would be considerably enhanced by an index.

The Vitamins. By H. C. Sherman and S. L. Smith. 2nd edition. An American Chemical Society Monograph. The Chemical Catalog Company, Inc. New York City. Price $6.00.

There are 347 pages of text, a very complete bibliography of 228 pages, a list of subject matter and an authors' index.

Chapter 1—A general introduction to the vitamin theory. This is an interesting summary of the history of vitamins.

Chapter 2—Vitamin B—(B-1). Its relationship to growth, its stimulation of appetite, and its antineuritic action. There are many other observations, experimental data, theories and conclusions.

Chapter 3—Vitamin G (B-2). A complete summary of the work done with this vitamin.

Chapter 4—Vitamin C.

Chapter 5—Vitamin A.

Chapter 6—Vitamin D.

Chapter 7—Vitamin E.

This monograph presents clearly an impersonal scientific account of the theories of the vitamin activities. It is readable, quite complete and up-to-date. Anyone should profit from a close study of this monograph.

Breast-Feeding. By Margaret Emslie, M.B., Ch.B. Humphrey Milford, Oxford University Press, 1931. Price $2.00.

This little book, written in the English manner and from the English point of view, is a reasonably good presentation of the subject under consideration, but contains little, if anything, new. Exceptions might be taken to many of the author's statements and there are numerous minor points on which many would not agree with her. In general, however, her advice is sound. The book seems more suitable for mothers, nurses and social workers than for physicians.

BOOKS RECEIVED FOR REVIEW

Sixty Centuries of Health and Physick by S. G. Blaxland Stubbs and E. W. Bligh. Published by Paul B. Hoeber Inc. 253 Pages. Price $5.00.

American Physicians and Surgeons in the United States and Canada. Prepared by James Clark Fifield. Published by The Midwest Company. 1737 Pages. Price $30.00.

Hypertension and Nephritis by Arthur M. Fishberg. Second Edition. Published by Lea & Febiger. 619 Pages. Price $6.50.

The Rational Treatment of Varicose Veins and Varicocele by W. Turner Warwick. Published by Faber and Faber, Ltd. 188 Pages. Price 5/-net.

Problèmes Actuels de Pathologie Médicale by A. Clerc, and others. Published by Masson et Cie. 329 Pages. Price 40 fr.

Studies from the Rockefeller Institute for Medical Research—Volume 78. Published by the Rockefeller Institute for Medical Research. 622 Pages.

International Studies on the Relation Between the Private and Official Practice of Medicine with Special Reference to the Prevention of Disease. Conducted by The Milbank Memorial Fund by Sir Arthur Newsholme. Volume Two. Published by The Williams and Wilkins Company and George Allen and Unwin Ltd. 249 Pages. Price $4.00.

Grace Revere Osler by Arnold Muirhead. Printed for Private Circulation at the Oxford University Press. 56 Pages.

Collected Papers of The Mayo Clinic and The Mayo Foundation. Edited by Mrs. Maud H. Mellish-Wilson, Richard M. Hewitt and Mildred A. Felker. Volume XXII, 1930. Published by W. B. Saunders Company. 1125 Pages. Price $13.00.

Proctoscopic Examination and the Treatment of Hemorrhoids and Anal Pruritus by Louis A. Buie. Published by W. B. Saunders Company. 178 Pages. Price $3.50.

A Clinical Study of Addison's Disease by Leonard G. Rowntree and Albert M. Snell. Published by W. B. Saunders Company. 317 Pages. Price $4.00.

The Surgical Clinics of North America. June, 1931. Volume 11, Number 3, New York Number. Published by W. B. Saunders Company. 239 Pages.

Scharlach—Atiologie, antitoxische Serumtherapie und Schutzimpfung by Prof. R. Kraus. Published by Urban & Schwarzenberg. 365 Pages.

STUDIES ON RAW WATER PRECHLORINATION

The results of studies on raw water prechlorination have recently been made public by the U. S. Public Health Service. The conclusions drawn from the report briefly are as follows:

Raw water prechlorination, when properly controlled, affords an effective and economical means of reinforcing the bacterial efficiency of rapid sand water filtration processes, these experiments having indicated that the permissible density of bacillus coli in the raw water could be slightly more than doubled by the use of this measure.

Maintenance of a controlled low residual chlorine in the applied water, averaging 0.05 parts per million and not exceeding 0.10 parts per million, gave more consistent and, in general, more satisfactory results than did superchlorination, with a high residual chlorine.

The bacterial efficiencies of filtration and of postchlorination appear, from these observations, to be measurably reduced as the result of prechlorination.

Although the length of filter run was not increased by prechlorination under the conditions of these experiments, the development of growths of microscopic organisms was perceptibly retarded by this treatment.

The application of prechlorinated water to rapid sand filters appears to lower the bacterial content and the biochemical oxygen demand of the filtering medium. Variations in both of these elements were found to bear a fairly definite relation to concurrent variations in the residual chlorine of the applied water.

More general observations made in the course of the experiments confirmed the prevalent impression that it is advantageous to prechlorinate before, rather than after, preliminary sedimentation in order to utilize the stabilizing effect of basin treatment prior to applying prechlorinated water to filters. They also indicated, however, that even with the stabilizing influence of such basin treatment careful technical supervision and laboratory control are necessary to maintain a relatively constant chlorine content of water applied to filters, which appears to be a desirable condition for consistently effective filtration. Although the ability of well-ripened filters to absorb excessive amounts of chlorine for considerable periods of time constitutes a valuable operating factor of safety, in so far as the production of overchlorinated effluents is concerned, any undue burdening of filters with excessively chlorinated water may be expected, as shown in these studies, to result in a measurable impairment of their bacterial efficiency.

The main advantage of prechlorination, from the viewpoint of this study, may be summed up as being its effectiveness and relative economy as a measure for reinforcing the over-all bacterial efficiency of the rapid-sand filtration process, when considered as a whole. Its principal disadvantage appears to be its tendency to cause a perceptible decrease in the bacterial efficiency of filtration and of postchlorination. From a practical standpoint this advantage appears, from the study herein described, to be outweighed by the advantage above indicated, though it should be taken into account in casting up a balance sheet of performance to be expected in applying this method of treatment.